

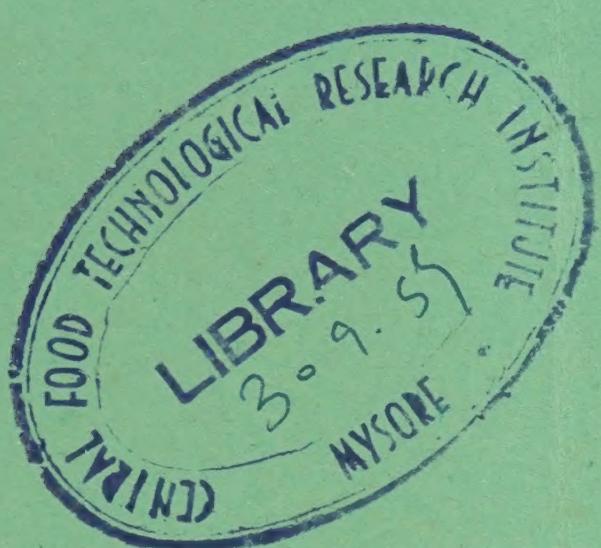
National Institute of Sciences of India
Report of the Council for the
Year ending 31-3-59

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NATIONAL INSTITUTE OF SCIENCES OF INDIA



REPORT OF THE COUNCIL FOR
THE YEAR ENDING 31-3-59



NEW DELHI

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NATIONAL INSTITUTE OF SCIENCES OF INDIA

(Registered under the Societies Registration Act XXI of 1860)

Annual Report for the Year ending 31st March, 1959

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The Council of the National Institute of Sciences of India has the pleasure in presenting the following report of the general concerns of the Institute for the year 1958-59, in accordance with the provisions of Rule 43 (f) of the Rules of the National Institute.

1. MEMBERSHIP

1. 1. The number of Fellows on the roll of the Institute at the beginning of the year was 320 Ordinary Fellows and 44 Honorary Fellows. Thirteen Ordinary Fellows were elected during this year. Three Ordinary and two Honorary Fellows died during the year. Two Ordinary Fellows (Dr. S. R. Bose and Dr. Z. R. Kothavalla) resigned. The total number at the end of the year 1958-59 was 328 Ordinary Fellows (against a limit of 350) and 42 Honorary Fellows (against a limit of 50). A complete list of the Fellows will be found in Appendix I.

2. ELECTION OF FELLOWS

2. 1. The following new Ordinary Fellows were elected during the year 1958-59 :

Dr. R. R. Bahadur (Calcutta)
 Sri B. B. Bhowmik (Calcutta)
 Sri D. L. Deshpande (Sindri)
 Prof. T. R. Govindachari (Madras)
 Prof. S. M. Mukherji (Hoshiarpur)
 Dr. C. Nanjundayya (Bombay)
 Prof. N. S. Nagendra Nath (Patna)
 Dr. S. K. Pande (Lucknow)
 Dr. K. Ramanathan (Bombay)
 Prof. A. K. Saha (Calcutta)
 Dr. S. S. Sarkar (Calcutta)
 Dr. S. M. Sikka (Delhi)
 Dr. R. J. Vakil (Bombay)

No Honorary Fellow was elected during the year.

3. OBITUARIES

3.1. The Council reports with deep regret the loss suffered by the death of the following :

Ordinary Fellows :

1. Prof. B. B. Dey
2. Dr. J. C. Ghosh
3. Prof. K. V. Giri

Honorary Fellows :

1. Prof. Reginald A. Daly
2. Prof. E. O. Lawrence

4. MEETINGS (INCLUDING SYMPOSIA AND LECTURES)

4.1. Six General Meetings were held during the year under report. Out of these, four Ordinary General Meetings were held at Srinagar (on June 26, 1958), at Waltair (on August 30, 1958), and at New Delhi (on December 5, 1958 and March 6, 1959). The Twenty-fourth Annual General Meeting was held at the Headquarters of the Institute, New Delhi, on October 17, 1958, at which the Report of the Council for 1957-58 was presented and the President (Prof. P.C. Mahalanobis) also reviewed the work of the Institute during that year. The Twenty-fourth Anniversary General Meeting was also held at New Delhi on January 20, 1959. This meeting was held in two sessions—a preliminary session at the Institute building where ordinary routine business were carried out and the main session at the Vigyan Bhawan where the President delivered his address on "Next Step in Planning". Sri Jawaharlal Nehru, Prime Minister of India, attended the main session of the Anniversary General Meeting at Vigyan Bhawan as the chief guest. In the course of his address he

said that the solution of the many problems with which the world was faced to-day lay in a logical and scientific approach. He described the cold war approach to problems as basically opposed to the "temper of science". He also referred to the criticism generally voiced against the education system in India and hoped that a time might come when education would be free. In his opinion the major barrier to the spread of education was not finances but lack of trained and competent teachers. In this context he was in general agreement with the views expressed by Prof. P.C. Mahalanobis in his Presidential address that higher education in India was still a monopoly of the rich and that the poorer section of the students did not often get adequate and proper opportunities, though having talent and ability.

4.2. Papers accepted for publication by the National Institute were read at the General Meetings. A list of these papers is given in Appendix VI.

Symposia

4.3. The following Symposia were held during the year under report :

August 25-26, 1958 : "Crystal Physics"—at Calcutta.

August 30, 1958 : "Hydrographic Survey and River Physics in India"—at Waltair.

October 17-18, 1958 : "Vegetable Oils and their Products"—at New Delhi.

4.4. The Symposium on "Crystal Physics" was held at the Indian Association for the Cultivation of Science, Calcutta. Prof. K. Banerjee was appointed Convener to organize the Symposium. Crystal Physics including determination of crystal structure has developed at a very rapid pace during the recent years. It was felt necessary to focus attention of Indian scientists to this fruitful subject in order to create a greater interest in some of the branches of this field of research in this country. To circumscribe the scope of this Symposium within the limit of those branches of the subject in which some nucleus had already been formed in India, the Convener invited contributions from workers in those branches, and the response he received was very encouraging. About 32 papers dealing with various phases of the subject were read and discussed.

4.5. The Symposium on "Hydrographic Survey and River Physics in India" was held at the Senate Hall of the Andhra University, Waltair. Dr. C. Mahadevan was appointed Convener for organizing the Symposium. He invited all universities and institutions in India engaged in research on the subject to contribute papers. In view of the fact that only about two months or so before the Symposium, the Central Board of Irrigation and Power had organized a research session and a seminar at Srinagar on the same and allied subjects where valuable contributions which were expected for this Symposium

were submitted, the response received was not very great. The suggestion of the Central Board of Irrigation and Power Commission to coincide this Symposium with their research session and seminar was received too late to postpone the dates of this Symposium. 12 contributions dealing with various phases of the subject were contributed to the Symposium. Prof. J. B. S. Haldane presided over the Symposium.

4.6. The Symposium on "Vegetable Oils and their Products" was held at New Delhi on October 17-18, 1958. Dr. U. P. Basu was appointed Convenor to organize it. He took steps to secure the co-operation of experts, concerned institutions and interested persons in the different Ministries of the Government dealing with the subject. The response was very encouraging and 56 papers were contributed to the Symposium. It was made out during the discussions that oil seeds are important commercial crops of India. They are largely used for providing fat content in the diet of the people and for providing raw materials for certain oil based industries, and they are a good foreign exchange earner. The nature of papers contributed indicated that there were untapped resources for exploitation and that in vegetable oils and their products new potentialities might be found which would step up exports and reduce imports.

4.7. The proceedings of these Symposia will be published in separate issues of Bulletins of the Institute.

5. COUNCIL

5.1. The Council as constituted at the Twenty-third Anniversary General Meeting on 5th January 1958, and which functioned until the election of new Council on 20th January 1959, was as follows :

| | |
|--------------------------|---|
| President : | Prof. P. C. Mahalanobis (Delhi) |
| Vice-Presidents : | Dr. V. R. Khanolkar (Bombay) Prof. D. S. Kothari (Delhi) |
| Treasurer : | Prof. Ram Behari (Delhi) |
| Foreign Secretary : | Dr. B. Mukerji (Lucknow) |
| Secretaries : | Sri S. Basu (Delhi) Prof. P. Maheshwari (Delhi) |
| Editor of Publications : | Prof. R. C. Majumdar (Delhi) |
| Members of Council : | Dr. K. N. Bagchi (Calcutta) Prof. K. Banerjee (Allahabad) Dr. U. P. Basu (Calcutta) Dr. K. R. Dixit (Ahmedabad) Prof. C. S. Ghosh (Bangalore) Prof. P. S. Gill (Aligarh) |

Prof. P. K. Kichlu (Delhi)
 Prof. C. Mahadevan (Waltair)
 Prof. G. P. Majumdar (Calcutta)
 Dr. B. P. Pal (Delhi)
 Dr. B. N. Prasad (Allahabad)
 Dr. Atma Ram (Calcutta)
 Prof T. S. Sadasivan (Madras)
 Prof. B. Sanjiva Rao (Gauhati)
 Prof. B. R. Seshachar (Bangalore)
 Prof. N. R. Tawde (Dharwar)
 Dr. K. Venkataraman (Poona)
 Dr. W. D. West (Sagar)

Representatives of the Government of India and Co-operating Academies :

| | |
|---|--|
| Government of India : | Prof. M. S. Thacker (Delhi) |
| Asiatic Society : | Prof. S. K. Mitra (Addl. Vice-President) (Calcutta) Dr. B. C. Kundu (Addl. Member) (Calcutta) |
| National Academy of Sciences, India : | Prof. Shri Ranjan (Addl. Vice-President)(Allahabad) Prof. P. L. Srivastava (Addl. Member) (Allahabad) |
| Indian Science Congress Association : | Prof. M. S. Thacker (Addl. Vice-President) (Delhi) Dr. B. N. Prasad (Addl. Member) (Allahabad) |
| Ex-Officio Members : (Past Presidents) | Prof. S. N. Bose (1949-1950) (Santiniketan) Dr. K. S. Krishnan (1953-1954) (Delhi) Dr. A. C. Ukil (1955-1956) (Calcutta) |

5.2. The Council which was elected at the Twenty-fourth Anniversary General Meeting on the 20th January, 1959, was as follows :

| | |
|--------------------------|--|
| President : | Prof. S. K. Mitra (Calcutta) |
| Vice-Presidents : | Dr. V. R. Khanolkar (Bombay) Prof. N. R. Sen (Calcutta) |
| Treasurer : | Prof. Ram Behari (Delhi) |
| Foreign Secretary : | Dr. B. Mukerji (Lucknow) |
| Secretaries : | Sri S. Basu (Delhi) Prof. P. Maheshwari (Delhi) |
| Editor of Publications : | Prof. R. C. Majumdar (Delhi) |

| | |
|-----------------------------|---|
| Members of Council : | Prof. C. S. Ghosh (Roorkee) Prof. P. S. Gill (Aligarh) Prof. B. C. Guha (Calcutta) Prof. P. K. Kichlu (Delhi) Prof. D. S. Kothari (Delhi) Prof. C. Mahadevan (Waltair) Prof. G. P. Majumdar (Calcutta) Dr. M. A. Moghe (Nagpur) Dr. B. N. Prasad (Allahabad) Dr. Atma Ram (Calcutta) Dr. M. S. Randhawa (Delhi) Dr. J. C. Ray (Calcutta) Prof. T. S. Sadasivan (Madras) Prof. B. Sanjiva Rao (Gauhati) Dr. V. Subrahmanyam (Mysore) Prof. N. R. Tawde (Dharwar) Dr. K. Venkataraman (Poona) Dr. W. D. West (Sagar) |
|-----------------------------|---|

Representatives of the Government of India and Co-operating Academies :

| | |
|---|---|
| Government of India: | Prof. M. S. Thacker (Delhi) |
| Asiatic Society : | Dr. K. N. Bagchi (Addl. Vice-President) (Calcutta) Dr. B. C. Kundu (Addl. Member) (Calcutta) |
| National Academy of Sciences, India : | Prof. Shri Ranjan (Addl. Vice-President)(Allahabad) Prof. K. Banerjee (Addl. Member) (Allahabad) |
| Indian Science Congress Association : | Prof. P. Parija (Addl. Vice-President) (Cuttack) Dr. B. N. Prasad (Addl. Member) (Allahabad) |
| Ex-Officio Members : (Past Presidents) | Dr. K. S. Krishnan (1953-1954) (Delhi) Dr. A. C. Ukil (1955-1956) (Calcutta). Prof. P. C. Mahalanobis (1957-1958) (Delhi) |

5.3. The Council held six meetings; out of these the four statutory meetings were held, respectively, on 26th June 1958 at Srinagar, on 30th August 1958 at Waltair, on 17th October 1958 at New Delhi and on 20th January 1959 at New Delhi. The two non-statutory meetings were held at New Delhi on 5th December 1958 and 6th March 1959. In addition to these a special statutory meeting of the Council was held at New Delhi on 9th and 10th April 1958 to discuss in further detail some of the points which were raised at the meeting of the Council held on 17th March 1958. Besides the members of Council some past members of Council resident in Delhi and other

Fellows were also invited to participate in the discussion. A memorandum on points which were to be discussed at this meeting was already published as an Appendix to the last Annual Report.

5·4. At all its meetings, the Council gave necessary directions for the various activities of the Institute pertaining to all spheres of its work. Particular mention is made of the following :

Award of the Meghnad Saha Gold Medal.

5·5. In the Annual Report for the year 1957-58 it was mentioned that the Council of the National Institute of Sciences of India had resolved to institute three gold medals to be called (i) the Meghnad Saha Gold Medal, (ii) the Shanti Swarup Bhatnagar Gold Medal, and (iii) the Sunder Lal Hora Gold Medal, each award to be made once every three years or at such intervals as the Council may decide from time to time. The Council also recommended that the first award be made in 1958.

5·6. The Council decided to make the first award of the Meghnad Saha Gold Medal in 1958. At the Anniversary General Meeting held on the 20th January 1959, the President announced the award of this Medal for 1958 to Prof. S. N. Bose, F.R.S.

Foreign Exchange difficulties in relation to scientific work in the country.

5·7. At the instance of the President the Council considered the question regarding the foreign exchange difficulties in relation to the hampering of scientific research in the country. Very often scientists complained that scientific work and progress were being seriously affected due to severe restrictions in the import of equipment costing even very small amount in foreign exchange. The President stated that he had been discussing this matter with various authorities and was prepared to take up the matter to higher quarters. The Council decided that the National Institute would try to collect information from the Fellows, academies, societies, etc. as to the extent to which the lack of minor items like stores or small replacements have stopped or retarded scientific work already under progress, what difficulties were being experienced in obtaining these supplies and whether any priorities could be indicated.

5·8. A questionnaire was circulated inviting details of requirements. The material collected has been referred to a Standing Committee with Prof. P. C. Mahalanobis, the then President, as Convener, and Prof M. S. Thacker as Chairman. The other members are Prof. S. N. Bose and Prof. D. S. Kothari.

C. S. I. R. Grant for Senior Research Fellowship.

5'9. The National Institute of Sciences of India has been awarding Senior and Junior Research Fellowships (of Rs. 500/- and 400/- per month respectively) for some years past, out of funds provided by the Government of India. The number of awards made by the Institute annually is too small in comparison with the number of qualified candidates. The Council of the NISI requested the Council of Scientific & Industrial Research to provide funds for two more Senior Research Fellowships. The Council of Scientific & Industrial Research was pleased to sanction an annual grant of Rs. 14,000/- for institution of two more Senior Research Fellowships spread over two years. The Council of the NISI records its thanks to the CSIR for this good gesture.

6. COMMITTEES

6'1. The various Standing Committees of the Institute are :

- (1) Sectional Committee (eight in number)
- (2) Finance Committee
- (3) Research Fellowships Committee
- (4) Grants Committee
- (5) Standing Committee for Organization of Symposia
- (6) Building Committee
- (7) Library Committee
- (8) Publication Advisory Board
- (9) Biological Board
- (10) Board for Physical Sciences
- (11) History of Science Board (in place of the Standing Committee for History of Sciences)

6'2. The names of the members of these Committees are given in Appendix II.

7. REPRESENTATION ON SCIENTIFIC BODIES

7'1. The following appointments of delegates to represent the Institute on various scientific bodies were made by the Council :

- (1) *Indian Association for the Cultivation of Science.*

Dr. Mata Prasad and Prof. P. S. Gill continued to represent the National Institute on the Council of the Indian Association for the Cultivation of Science for the year 1958-59.

- (2) *Indian Standards Institution.*

Prof. P. S. Gill continued as representative of the National Institute on the General Council of the Indian Standards Institution till the

meeting of the Council held on 20th January 1958 when Prof. P. K. Kichlu was nominated representative in his place. Prof. R. P. Mitra continued to represent the Institute on the Chemical Division of the Indian Standards Institution. (Dr. B. Mukerji continued as alternative representative on the Chemical Division).

(3) *Indian National Commission for co-operation with Unesco.*

The Council nominated the following as representatives on the Indian National Commission for Unesco :

The President

One of the Secretaries

One of the Fellows not necessarily a member of the Council to be nominated by the President.

(4) *Indian Institute of Science, Bangalore.*

The President of the NISI and Dr. H. J. Bhabha continued to represent the NISI on the Council and Court respectively of the Indian Institute of Science.

(5) *Indian Statistical Institute, Calcutta.*

Dr. V. G. Panse continued as representative of NISI on the Governing Body of the Research and Training School of the Indian Statistical Institute.

(6) *All India Council of Technical Education.*

The President was nominated as representative of the NISI on the All India Council of Technical Education.

8. INTERNATIONAL UNIONS AND CONFERENCES

8.1. With the growth of the sciences and technology in Asia and the Far East greater interest is developing in international co-operation in science at the growing number of international scientific and technical conferences which are being held in these countries. A list of such conferences held in South Asia and a list of Fellows who attended various International Conferences held in different parts of the world during 1958-59 are given in Appendix V.

9. GRANTS-IN-AID

Publications :

9.1. The National Institute of Sciences of India has been disbursing for some years past grants to scientific societies of India to help their publications. The Council this year felt it appropriate to review the cases for grants that the

Institute has been making to the societies. For this purpose several sub-committees were appointed in various subjects to go into the matter keeping in view the income and expenditure of societies, quality of their journals, etc.

9.2. The following publication grants were made during the year. In allotting the grants, utmost consideration was given to the recommendations of these sub-committees :

| | | Rs. |
|---|-----|-------|
| Indian Science News Association, Calcutta | ... | 2,000 |
| National Academy of Sciences, India, Allahabad | ... | 2,000 |
| Current Science Association, Bangalore | ... | 2,000 |
| Science Club, Calcutta | ... | 750 |
| Indian Science Congress Association, Calcutta | ... | 1,000 |
| Association of Scientific Workers of India, Kanpur | ... | 500 |
| Indian Society of Agricultural Statistics, New Delhi | ... | 1,000 |
| Calcutta Mathematical Society, Calcutta | ... | 1,000 |
| Indian Mathematical Society, Madras | ... | 2,000 |
| Institution of Chemists (India), Calcutta | ... | 1,450 |
| Society of Biological Chemists, India, Bangalore | ... | 600 |
| Indian Chemical Society, Calcutta | ... | 2,000 |
| Indian Society of Soil Science, New Delhi | ... | 500 |
| Indian Institute of Chemical Engineers, Jadavpur, Calcutta | ... | 500 |
| Indian Geographical Society, Madras | ... | 500 |
| Geological, Mining & Metallurgical Society of India, Calcutta | ... | 1,000 |
| Mining, Geological & Metallurgical Institute of India, Calcutta | ... | 1,000 |
| Indian Phytopathological Society, New Delhi | ... | 1,000 |
| International Society of Plant Morphologists, Delhi | ... | 1,000 |
| Indian Botanical Society, Varanasi | ... | 2,000 |
| Indian Society of Genetics & Plant Breeding, New Delhi | ... | 1,000 |
| Entomological Society of India, New Delhi | ... | 1,500 |
| Zoological Society of India, Calcutta | ... | 2,000 |
| Helminthological Society of India, Calcutta | ... | 500 |
| Indian Dairy Science Association, Bangalore | ... | 1,000 |
| Indian Pharmaceutical Association, Bombay | ... | 1,000 |
| All India Veterinary Association, Madras | ... | 500 |
| Physiological Society of India, Calcutta | ... | 500 |
| Indian Physical Society, Calcutta | ... | 2,000 |
| Indian Psychological Association, Calcutta | ... | 500 |
| Geographical Society of India, Calcutta | ... | 500 |
| Indian Institute of Metals, Calcutta | ... | 500 |
| Asiatic Society, Calcutta | ... | 1,250 |
| India Society of Engineers, Calcutta | ... | 1,000 |
| Institution of Telecommunication Engineers, New Delhi | ... | 500 |
| Society of Experimental Medical Sciences, Calcutta | ... | 500 |
| National Geographical Society of India, Varanasi | ... | 500 |

| | | |
|--|-----|-----|
| Association of Indian Geographers, New Delhi | ... | 500 |
| Ethnographic & Folk Culture Society, Lucknow | ... | 500 |

Recommendations for grants from Central Revenues :

9.3. The following learned societies were recommended for grants-in-aid from Central Revenues for amounts noted against each :

1958-59

| | | | |
|---|---------------|-----|--------|
| Vigyan Parishad, Allahabad | ... | ... | 10,500 |
| Mycological Society, Calcutta | ... | ... | 2,200 |
| Geological, Mining & Metallurgical Society of India, Calcutta | | | 3,000 |
| Association of Indian Geographers, New Delhi | ... | ... | 5,000 |
| Current Science Association, Bangalore | ... | ... | 7,000 |
| Calcutta Mathematical Society, Calcutta | ... | ... | 2,000 |
| Indian Mathematical Society, Madras | ... | ... | 5,000 |
| Bangiya Vijnan Parishad, Calcutta | Capital Grant | ... | 12,500 |
| | Recurring | ... | 9,000 |

1959-60

| | | | |
|-----------------------------------|-----|-----|-------|
| Indian Physical Society, Calcutta | ... | ... | 5,000 |
|-----------------------------------|-----|-----|-------|

10. PREPARATION OF HISTORY OF SCIENCES IN INDIA

10.1. A History of Science Board consisting of the following members was constituted to formulate the proposals for the preparation of History of Sciences in India:

Dr. A. C. Ukil (Convener)
 Dr. G. P. Majumdar
 Dr. D. D. Kosambi
 Dr. A. S. Altekar

with powers to co-opt additional members.

10.2. The Council accepted the recommendation of the Board regarding plan of work for the remaining period of the Second Five Year Plan and approached the Government of India for an annual grant of Rs. 30,800 for the remaining period of the Second Five Year Plan for creation of two Units to go ahead with the preparation of exhaustive bibliography of available literature covering the period from ancient times to 1200 A.D. The detailed recommendation of the Board, which was accepted by the Council, is given in Appendix III.

11. RESEARCH FELLOWSHIPS

11.1. The following Research Fellows were appointed during the year 1958-59:

NIS Senior Research Fellowship

- (i) Appointed in June 1958 :
- (1) Dr. S. K. Srinivasan for work on "Elementary particle interactions" at Madras University, Madras. (Joined on 5. 8. 58)
 - (2) Dr. (Miss) S. Kumari for work on "Summability of Infinite series" at Allahabad University, Allahabad. (Joined on 23. 7. 58)
 - (3) Dr. A. C. Jain for work on "Chemical investigation of the Naturally occurring Quinonoid Anhydrobases and Related Compounds" at Delhi University, Delhi. (Joined on 1. 8. 58)
 - (4) Dr. U. Aswathanarayana for work on "Geophysical and Geochemical studies on Radioactive elements" at Andhra University, Waltair. (Did not join)
 - (5) Dr. C. S. Venkatesh for work on "Genecological and experimental studies on the Taxonomy of some Indian plants" at Delhi University, Delhi. (Joined on 18. 7. 58)
 - (6) Dr. D. K. Biswas for work on "Role of Ascorbic Acid in the intermediate metabolism of Carbohydrate" at Presidency College, Calcutta. (Joined on 1. 8. 58)
- (ii) Appointed in January 1959 :
- (7) Dr. Ram Kumar for work on "Integral Transforms and their Application" at Indian Institute of Science, Bangalore. (Did not join)
 - (8) Dr. S. K. Brahma for work on "Development (Experimental embryology)" at Indian Institute of Bio-chemistry & Experimental Medicine, Calcutta. (Did not join)

NIS Junior Research Fellowship :

- (i) Appointed in June 1958 :
- (1) Sri M. R. Parameshwaran for work on "Theory of Summability" at Ramanujan Institute of Mathematics, Madras. (Joined on 16. 7. 58)
 - (2) Miss L. Ray for work on "Determination of the structure of Rauwolfia alkaloids specially the structure of Nor-Harman by the X-ray methods" at Calcutta University, Calcutta. (Joined on 1. 8. 58)
 - (3) Sri A. K. Chaudhuri for work on "Polymerization of Methyl Isopropenyl Ketone" at the Indian Association for the Cultivation of Science, Calcutta. (Joined on 16. 7. 58)
 - (4) Dr. (Miss) A. Sarkar for work on "Mycology in relation to Forest Pathology" at Calcutta University, Calcutta. (Joined on 28. 7. 58)

- (5) Sri G. Sarana for work on "Kinship system and fertility in an Indian Tribal Community" at Lucknow University, Lucknow. (Joined on 16. 10. 58)
- (6) Dr. B. Roy for work on "Application of electronics and nucleonics in medical science" at the Department of post-graduate Medical Education & Research, Calcutta University, Calcutta. (Joined on 1. 9. 58).
- (7) Sri P. Roy for work on "Extraction of Vanadium and preparation of Ferro-Vanadium from vanadiferous from iron ores of India" at Banaras Hindu University, Varanasi. (Joined on 27. 6. 58).
- (8) Dr. J. S. Murthy for work on "Ultrasonic Cavitation" at Andhra University, Waltair. (Joined on 1. 9. 58).

I.C.I. (India) Research Fellowship:

- (i) Appointed in June 1958 :

- (1) Dr. T. P. C. Sastry for work on "Analytical and physico-chemical studies on (1) Azo (2) Indanthrene and (3) Phthalocyanine dyes" at Andhra University, Waltair. (Did not join)
- (2) Dr. D. Subramanian for work on "Fungal Enzymes and plant Wilts" at Madras University, Madras. (Joined on 1. 8. 58)
- (3) Mrs. R. V. Iyer for work on "Bacterial resistance to the tetracyclines" at S. B. Garda College, Navsari. (Joined on 29. 7. 58)

11. 2. The following Research Fellows completed the Fellowships on the dates shown alongside :

NIS Senior Research Fellowship :

- (1) Dr. S. Narayanaswami—17. 7. 58 (Completed 2 years)
- (2) Dr. A. Guha—31. 3. 59 (Completed 2 years)

NIS Junior Research Fellowship :

- (1) Dr. (Mrs.) P. Sinha—1. 10. 58 (Completed 2 years)
- (2) Dr. H. R. Srinivasachar—27. 6. 57 (Completed 2 years)
- (3) Dr. (Miss) Sulaxana Kumari—22. 7. 58 (Completed 2 years)

I.C.I. (India) Research Fellowship :

- Dr. (Mrs.) M. Datta—9. 9. 58 (Completed 2 years)

11.3. The following Research Fellowships were extended for the periods as shown alongside :

NIS Junior Research Fellowship :

Dr. C. A. Ninan—one year from 30. 6. 58

I.C.I. (India) Research Fellowship :

Dr. (Miss) L. S. Devi—one year from 1. 7. 58

11.4. The following Research Fellows resigned from the dates as shown alongside :

Senior :

Dr. G. Suryanarayanan—1. 7. 58 (got a post of Lecturer in the Indian Institute of Science, Bangalore)

Dr. (Miss) Sulaxana Kumari—1. 10. 58 (got a post of Asstt. Professor of Mathematics, Gorakhpur University)

Junior :

Sri B. B. G. Sarma—1. 7. 58 (got a scholarship from the U. S. Government)

Dr. S. K. Pavanaram—20. 4. 58 (to do work under Dr. Hans Schmid at Zurich under the Financial aid given by Volkart Foundation, Switzerland)

Sri Santokh Singh—1. 8. 58 (got a post of Lecturer in Department of Entomology, St. John's College, Agra)

Sri M. S. Ramanujan—29. 7. 58 (got a post of Lecturer in the Department of Mathematics, Muslim University, Aligarh)

Dr. R. Srinivasan—2. 2. 59 (got National Research Fellowship)

I.C.I.

Dr. K. Subba Rao—1. 7. 58 (got a post in the Andhra University, Waltair).

11.5. Summaries of final research reports of the Research Fellows who worked for more than one year and left the Fellowships are given in Appendix IV.

12. BUILDING

12.1. The Council decided to get a master plan of the extensions to the building of NIS prepared, the construction work to be taken in hand by stages according as funds made available. The Council agreed to the proposal of the frontage of the building being suitably re-modelled and also to the immediate construction of a library block to the South of the present building. Accordingly, architects were appointed.

12. 2. Detailed estimates (amounting to Rs. 8,71,491) of cost of additional buildings proposed to be constructed in the Institute which had been prepared by the Architects were submitted to the Government of India. When the plans submitted to the Corporation of Delhi were approved, construction was taken in hand. During the Anniversary General meeting held on the 20th January 1959 the President inaugurated the construction by digging out the first lump of earth from the area of new construction.

12. 3. For the present, tenders for construction of a Library block, remodelling the facade of the existing building and extension to servants' quarters were called. The construction work was taken in hand by the contractors in the second week of March, 1959.

12. 4. The Government of India paid Rs. 50,000 as non-recurring grant for construction of buildings during the year 1958-59.

13. THE LIBRARY

13. 1. About 1096 books have been added to the Library during 1958-59 costing about Rs. 50,000.

13. 2. Some steel shelving racks have been added to the Library to accommodate the books received.

13. 3. Total number of journals and periodicals received in the Library on exchange and subscription stands at about 375. The list of journals is given in the Appendix VII.

13. 4. The following books were presented to the Library during the year :

1. N. Foundation for Infantile Paralysis
Collected reprints of the grantees of the F.F.I.P.—1957.
2. Collected reprints of the grantees of the F.F.I.P. Vol. XVIII (II)
3. Index to collected reprints. 1951-56.
4. Science Council of Japan.
Proceedings of the International Genetics Symposia 1956.
Tokyo & Kyoto.
5. C. S. I. R.
Antibiotics—a Symposium held at the Hindustan Antibiotics (Pte.) Ltd., Pimpri, March 27—30th, 1956.
6. C. S. I. R.
Indian Clays, their occurrence and characteristics, Part I. Samples examined.

7. C. S. I. R.

Essential oils and aromatic chemicals—a symposium.

8. Arrow, G. J.

The Fauna of British India (Vol. IV).

Coleoptera, lamellicornia, lucanidae and passalidae.

9. Defence Science Organization, India.

Nuclear Explosions Their effects.

10. Hawkins, R. R.

Scientific, Medical & Technical Books published in the USA, 2nd supplement 1949-1952.

14. PUBLICATIONS

Proceedings :

14.1. The following issues of the Proceedings were published during the year under report :

Part A. (Physical Sciences).

Vol. 24, Nos. 1—6 (pp. 1—445)

Vol. 25, Nos. 1—2 (pp. 1—153)

Part B. (Biological Sciences)

Vol. 24, Nos. 1—6 (pp. 1—329)

Vol. 25, No. 1 (pp. 1—53)

Title page and Index to Vol. 23 were also published.

Transactions

14.2. A paper by Dr. W.D. West on "The Petrography and petrogenesis of 48 flows of Deccan Trap penetrated by boring in West India" was published (Transactions, Vol. IV, No. 1).

The following Bulletins were published :

No. 10. Symposium on "Climate, Environment and Health".

No. 11. Symposium on "Geophysical Research including Geodesy".

No. 12. Symposium on "Contact Catalysis."

No. 13. Symposium on "Radio Isotopes".

No. 14. Symposium on "Crystal Physics".

15. FINANCES AND INSTITUTE FUNDS

15.1. During the year 1958-59 Government of India sanctioned a recurring grant of Rs. 4,26,000/- . The recurring grant was utilized towards expenditure on salaries, research fellowships, travelling expenses, library, publications of the Institute (Proceedings, Transactions, Symposia Bulletins etc.),

Publication Grant to scientific societies, rent of land, house tax and contingencies etc. In addition to the Recurring Grant the Government of India sanctioned a grant of Rs. 50,000 as the first instalment of the non-recurring grant towards extension of buildings, and also another amount of Rs. 39,100/- to meet the part of deficit of the year 1957-58. As the deficit of last year was met by taking a loan from the Temporary Reserve Fund this amount has been transferred to that account. Grants amounting to Rs. 1,300/- were also received from Universities of Bombay and Osmania. Bombay University paid Rs. 1,000/- for the year 1957-58. During the year there was an overall deficit of Rs. 530/76.

15.2. The details of various Funds are given in the Balance Sheet (Appendix IX). An explanatory note on some of the major funds is given below :

(a) *Funding Account* :

This fund comprises donations received from public bodies, individuals, admission fees and compounding fees of the Fellows of the Institute. The amounts received on this account are utilised separately and interest accruing from these investments is utilized for general expenses of the Institute.

This account stands as under :

| | | | |
|--|-----|-----|---------------|
| Balance as on 31. 3. 58 | ... | ... | Rs. 61,640.03 |
| Receipts during the year (admission fees & compounding fees) | ... | ... | 1,136.00 |
| | | | 62,776.03 |

(Donations Rs. 36,400.03, admission fees Rs. 14,464.00 and compounding fees Rs. 11,912.00).

Investments :

| | | |
|-----------------------------------|-----|------------|
| 4% loan 1960-70 F. V. | ... | Rs. 17,000 |
| 3% conversion loan 1946 | ... | 29,600 |
| State Bank of India Fixed Deposit | ... | 10,877.00 |
| State Bank of India Saving Bank | ... | 7,709.79 |

(b) *Chandrakala Hora Memorial Medal Endowment*

Dr. S. L. Hora and Mrs. V. Hora endowed a sum of Rs. 3,000/- in 1945 in memory of their daughter for award of medal quinquennially to the person who has made conspicuously important contribution to the development of fisheries in India during the five years preceding the year of award.

The present position of the fund is as below :

| | | |
|-----------------------------|---------|----------------|
| Balance as on 31. 3. 58 ... | ... ... | Rs. 3,900.75 |
| Interest during the year | ... ... | 100.00 |
| | | <hr/> 4,000.75 |

Investments :

| | | |
|---------------------------------|---------|--------------|
| 3% conversion loan 1946 | ... ... | Rs. 3,000.00 |
| State Bank of India Saving Bank | ... ... | 1,000.75 |

(c) *General Fund :*

This fund represents excess of income over expenditure against the receipts and payments of the Institute :

The present position of this fund is as below :

| | | |
|--|---------|-----------------|
| Balance as on 31. 3. 58 | ... ... | Rs. 1,82,908.31 |
| Add transfer from Income & Expenditure Account | ... ... | 57,560.75 |
| | | <hr/> |
| | | 2,40,469.06 |

This fund is mainly represented by fixed assets, viz. furniture and library books, etc.

(d) *I.C.I. (India) Research Fellowship Fund :*

This fund represents savings from the contingency grants of Research Fellowships. Its position is as below :

| | | |
|--|---------|----------------|
| Balance as on 31. 3. 58 ... | ... ... | Rs. 5,569.16 |
| Add transfer from Income & Expenditure Account | ... ... | 751.91 |
| | | <hr/> 6,321.07 |

(e) *Temporary Reserve Fund :*

This fund represents the savings effected from I.C.I. Administration Grant of Rs. 13,200/- received annually for administration of I. C. I. Research Fellowships.

The present position of this Fund is as below :

| | | |
|---|---------|-----------------|
| Balance as on 31. 3. 58 | ... ... | Rs. 50,587.27 |
| Add amount received from the Government of India towards deficit of last year | ... ... | 39,100.00 |
| | | <hr/> 89,687.27 |

(f) *Employees' Provident Fund :*

The total amount in this Fund at the close of the year stood at Rs. 30,854.03. This amount represents deductions from the salaries of the staff, contribution by the Institute and interest accrued from the investments :

Investments :

| | |
|---|---------------|
| Fixed Deposit with the State Bank of India, Delhi | Rs. 26,561.00 |
| State Bank of India Delhi Saving Bank Account | Rs. 4,293.03 |
| | 30,854.03 |

(g) *Popularization of Science Fund :*

This fund was opened for Popularization of Science in India. The balance in this fund at the close of the year stood at Rs. 3,792/-.

(h) *Dr. S. S. Bhatnagar Memorial Fund :*

The total amount to the credit of this fund was Rs. 5,366.25. This contribution has been received from individuals, societies and Fellows of the Institute.

APPENDIX I
LIST OF FELLOWS
ORDINARY FELLOWS
[F—Foundation Fellows]

| Serial No. | Year of election | | Service on Council |
|------------|------------------|---|--|
| 1. | 1936 | ‡ABRAHAM, W.E.V., Maj.-Gen., A.R.C.S., M. Inst. P.T., Managing Director, Burmah Oil Co., Ltd., Kenkot Manor, Lechlade, Glos., England. | |
| 2. | F | AGHARKAR, S. P., M.A., Ph.D., F.L.S., Director, Maharashtra Association for the Cultivation of Science, Law College, Poona 4. | Sec. V.P. 1935-1944; 1945, 1956-1957; Ad. V.P. 1946, 1953; Mem. 1947-1948. 1950-1952, 1954-1955. |
| 3. | 1938 | AIYAR, R. GOPALA, M.A., L.T., M.Sc., 102 Lloyds Road, Gopalapuram, Cathedral P.O., Madras 6. | Ad. Mem. 1939-1940 |
| 4. | 1958 | ALI, SA'LIM, Vice-President, Bombay Natural History Society; 33 Pali Hill, Bandra, Bombay 20. | |
| 5. | 1950 | ‡ANTIA, D. P., Sc.D., F.I.M., Director, National Carbon Co. (India) Ltd., Ilaco House, 1 & 3 Brabourne Road, Post Box No. 2170, Calcutta 1. | |
| 6. | 1953 | ‡ANTIA, K. F., M.Sc. (Lond.), B.Sc. (Eng.) (Lond.), M.I.E., M.I. struct, E., F.P.W. Inst., "Rockside", 112 Walkeshwar Road, Malabar Hill, Bombay 6. | |
| 7. | 1951 | ASUNDI, R. K., B.A., M.Sc., Ph.D. (Lond.), "Shri Sadan" Block 6, 16 Juhu Road, Santa Cruz, Bombay 23. | |
| 8. | 1953 | ATMA RAM, D.Sc., F.S.G.T., Director, Central Glass and Ceramic Research Institute, P.O Jadavpur University, Calcutta 32. | Govt. rep. 1956 : Mem 1958- |
| 9. | 1938 | AUDEN, J. B., M.A., Sc.D. (Cantab), F.A.S., 39 Cromwell Road, London, S.W. 7, England. | |
| 10. | 1950. | AULUCK, F. C., Ph.D., D.Sc., Professor of Physics, Delhi University, Delhi 8. | |
| 11 | F | AWATI, P. R., B.A. (Cantab), D.I.C., I.E.S. (Retd.), 47/5 Prabhat Road, Poona 4. | Mem. 1944-1945. |
| 12. | F | BAGCHEE, K., D.Sc., D.I.C., 'Nanda Deep', 63/A Rajpur Road, Dehra Dun. | Mem. 1943-1945. |
| 13. | 1940 | BAGCHI, K. N., B.Sc., M.B., D.T.M., F.S.M.F., F.R.I.C., Principal, Calcutta National Medical College ; Gulistan, 5 Ballygunge Place, Calcutta 19. | Mem. 1942. 1947-1949. 1953-1955 1958: Ad. Mem. 1946: Trea. 1943-1945: Ad. V.P. 1951-1952. |

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| Serial No. | Year of election | Service on Council |
|------------|------------------|---|
| 14. | 1959 | BAHADUR, R. R., M.A., Ph.D. (N. Carolina), Indian Statistical Institute, 203 Barrackpore Trunk Road, Calcutta 35. |
| 15. | 1955 | BAMBAH, R. P., M.A., Ph.D. (Cantab), Professor of Mathematics, Panjab University, Chandigarh. |
| 16. | 1939 | BANERJEE, K., D.Sc., Professor of Physics, Allahabad University, Allahabad. Mem. 1957 - 1958 Ad. Mem. 1959- |
| 17. | 1952 | BANERJEE, S., M.B.B.S., D.Sc., Professor of Physiology, Bikaner Medical College, Bikaner (Rajasthan). |
| 18. | 1958 | BANERJEE, T., Ph.D., D.Sc., F.R.I.C., F.I.C., F.I.M., Deputy Director, National Metallurgical Laboratory, Burma Mines P.O., Jamshedpur 7. |
| 19. | F | BANERJI, A. C., M.Sc., M.A., F.R.A.S., I.E.S., 8/3 Loudon Street, Calcutta 16. Ad. Mem. 1935-1936-1940-Ad.V.P.-1946 1947, 1952 1953- Mem. 1948; V.P. 1949-1950. |
| 20. | 1945 | BANERJI, I., D.Sc., F.L.S., F.A.Sc., F.B.S., Head of the Department of Botany, Calcutta University ; 131 Harish Mukherji Road, Kalighat, Calcutta 26. |
| 21. | F | ‡BANERJI, S. K., D.Sc., F.R.M.S., 3 Ramani Chatterjee Road, R B. Avenue P.O., Calcutta 29. Mem 1946-1947, 1949-1951, V.P. 1953-1954. |
| 22. | 1954 | BASU, B. C., D.Sc., 22P Sreenath Mukherjee Lane, Paikpara, Calcutta 30. |
| 23. | 1941 | BASU, J. K., M.Sc., Ph.D. (Lond.), Director of Soil Conservation, Ministry of Food & Agriculture, Multi-Storeyed Building, Queen Victoria Road, New Delhi. |
| 24. | 1956 | BASU, J. N., Dr. Ing. (Berlin), Professor of Mechanical Engineering, Jadavpur University ; "Bani Vitan", 25 South End Park, Calcutta 29. |
| 25. | 1951 | BASU, K. P., D.Sc., (Dacca), Ph.D. (Munich), Special Officer Scientific Research, Planning Commission, Udyog Bhavan, New Delhi 2. |
| 26. | 1944 | BASU, N. M., M.Sc., 63 Hindusthan Park, Ballygunge, Calcutta 29. |
| 27. | 1946 | ‡BASU, S., M.Sc., Director-General of Observatories, Meteorological Office, Lodi Road, New Delhi. Mem. 1948-1950; Sec. 1957- |
| 28. | 1946 | BASU, U. P., D.Sc., Director, Bengal Immunity Research Institute; 23/3 Gariahat Road, Calcutta 19. Ad. Mem. 1953-1955; Mem. 1956-1958. |
| 29. | 1941 | BEHARI, RAM, M.A. (Pure Math.), M.A. (Applied Math.) (Punjab), Professor and Head of the Department of Mathematics & Statistics, Delhi University, Delhi 8. Trea. 1957- |

| Serial No. | Year of election. | Service on Council |
|------------|-------------------|---|
| 30. | 1941 | BHABHA, H. J., D.Sc., F.R.S., Director, Tata Institute of Fundamental Research, Director, Atomic Energy Establishment, Trombay, Secretary to the Government of India, Department of Atomic Energy and Chairman, Atomic Energy Commission, Apollo Pier Road, Bombay. Mem. 1944 - 1945 : 1948-1949; 1951- 1952; V. P. 1946- 1947. |
| 31. | 1949 | BAHDURI, J. L., D.Sc. (Edin.), F.A.S., F.Z.S.I., F.A.Z., Sir Nilratan Sircar Professor and Head of the Department of Zoology, Calcutta University, 35 Ballygunge Circular Road, Calcutta 19. Ad. Mem. 1950-1951: Mem. 1952-1954. |
| 32. | 1944 | BHADURI, P. N., Ph.D., F.R.M.S., F.R.H.S., F.L.S., Professor of Botany, Presidency College, Calcutta 12. |
| 33. | 1949 | BHAGAVANTAM, S., D.Sc., Director, Indian Institute of Science, Bangalore 12. Mem. 1951-1953. 1956-1957. |
| 34 | 1956 | BHAR, J. N., D.Sc. (Cal.), Sir Rashbehari Ghose Professor of Physics and Head of the Department of Radio Physics and Electronics, Calcutta University, 92 Upper Circular Road, Calcutta 9. |
| 35. | 1937 | ‡BHARADWAJA, YAJNAVALKYA, M.Sc., Ph.D. (Lond.), F.L.S., B-333 Mahanagar, Lucknow. |
| 36. | 1939 | ‡BHARUCHA, F. R., M.Sc., D.Sc., Institute of Science, Mayo Road, Fort, Bombay 1. |
| 37. | 1958 | BHAT, J. V., Ph.D., D.Sc., F.R.I.C., F.A.Sc., Assistant Professor, Fermentation Technology Laboratory, Indian Institute of Science, Bangalore 12. |
| 38. | 1955 | BHATIA, M. L., Ph.D., D.Sc. (Panjab), Professor and Head of the Department of Zoology, Delhi University, Delhi 8. |
| 39. | 1950 | BHATNAGAR, P. L., D.Phil., D.Sc., Professor and Head of the Department of Applied Mathematics, Indian Institute of Science, Bangalore 12. |
| 40. | 1956 | BHATTACHARYA, P., M.Sc., Ph.D. (Edin.), Assistant Director and Head of the Division of Animal Genetics, Indian Veterinary Research Institute, Izatnagar. |
| 41. | 1954 | BHATTACHARYA, S. K., D.Sc., F.R.I.C., Professor and Head of the Department of Applied Chemistry, Indian Institute of Technology, Kharagpur. |
| 42. | 1948 | BHIMACHAR, B. S., D.Sc., Chief Research Officer, Central Inland Fisheries Research Station, Barrackpore, via Calcutta. |
| 43. | 1959 | BHOWMIK, B. B., M.Sc. (Eng.) (Lond.), X-ray and Electro-medical Engineer, 7 Sirdar Sankar Road, Calcutta 26. |

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| Serial No. | Year of election. | Service on Council |
|------------|-------------------|--|
| 44. | 1950 | BISWAS, K., M.A., D.Sc. (Edin.), F.R.S.E., F.A.S., F.B.S., Director, Medicinal Plants, Government of West Bengal ; P-19 Old Ballygunge Road, P. O. Ballygunge, Calcutta 19. |
| 45 | 1935 | BOMFORD, G., Brigadier, O.B.E., M.A., D.Sc. (Oxon), F.G.S., Hainton Lodge, Sutton Courtenay, Berkshire, England. |
| 46. | 1941 | ‡BOR, N. L., C.I.E., M.A., O.B.E., D.Sc., F.R.S.E., F.L.S., c/o Messrs. Lloyds Bank Ltd., 6 Pall Mall, London, S.W. 2. |
| 47. | 1957 | BOSE, A., D.Sc., Professor of Physics, Department of Magnetism, Indian Association for the Cultivation of Science, Jadavpur, Calcutta 32. |
| 48. | F | BOSE, D. M., M.A., B.Sc., Ph.D., Director, Bose Institute, 93 Upper Circular Road, Calcutta 9. Ad. Mem. 1942-1944 Ad. V.P. 1953, 1955-1956. |
| 49. | 1950 | BOSE, J. P., M.B., F.C.S., 'The Sanctuary', 41/4A Bagbazar Street, Calcutta 3. |
| 50. | 1938 | BOSE, N. K., M.Sc., Ph.D., Comp. I.E. (Ind.), 40/7 Gariahat Road (South), Calcutta 31. |
| 51. | 1955 | BOSE, NIRMAL KUMAR, M.Sc., Director, Department of Anthropology, Government of India, Indian Museum, 27 Chowringhee Road, Calcutta 13. Ad. Mem. 1957 |
| 52. | 1948 | BOSE, P. C., B.Sc. (Glas.), Chief Engineer, Public Health Engineering, Government of West Bengal ; New Secretariat Buildings (6th Floor), 1 Hastings Street, Calcutta 1. |
| 53. | 1944 | BOSE, P. K., D.Sc., 99/5 Ballygunge Place, Calcutta 19. |
| 54. | 1942 | BOSE, R. C., M.A., Professor, Institute of Mathematical Statistics, University of N.Carolina, Chapel Hill, N.C., U.S.A. |
| 55. | | BOSE, S. N., M.Sc., F.R.S., National Professor, Dept. of Physics, University College of Science, 92 Upper Circular Road, Calcutta 9. Ad. V.P. 1943; V.P. 1947-1948; Pres. 1949-1950. |
| 56. | 1953 | ‡BÜCHI, E. C., Ph.D., Rebhang 6, Schaffhausen, Switzerland. |
| 57. | 1956 | CADAMBE, V., M.Sc., M.S., (Cal. Tech.), A.F.I.Ae.S. (Lond.), F.I.M. (Lond.), M.I. Mech. E. (Lond.), M.I. Struct. E. (London), Director, Central Mechanical Engineering Research Institute, Mahatma Gandhi Avenue, P.O. Durgapur Steel Project, Durgapur 3 (Dist. Burdwan, West Bengal) |
| 58 | 1949 | CHAKRABARTY, S. K., D.Sc., Head of the Department of Mathematics, Bengal Engineering College, Botanic Gardens P.O., Howrah. |

| Serial No. | Year of election. | Service on Council | |
|------------|-------------------|---|--|
| 59. | 1949 | CHAKRAVARTI, D., D.Sc., Registrar, Calcutta University; 28-3 Sahanagar Road, Kalighat, Calcutta 26. | |
| 60. | 1955 | CHAKRAVARTI, D. N., Lt.-Gen., M.B.B.S., D.T.M.H., D.B. (Lond.), Secretary, Department of Health and Director of Health Services, Government of West Bengal, Writers' Buildings, Calcutta 1. | |
| 61. | 1956 | ‡CHAKRAVARTI, R. N., D.Sc. (Cal.), F.R.I.C., Professor of Chemistry, Calcutta School of Tropical Medicine, Chittaranjan Avenue, Calcutta 12. | |
| 62. | 1954 | CHANDRASEKHARAN, K., Ph.D., Professor of Mathematics, Tata Institute of Fundamental Research, Apollo Pier Road, Bombay. | |
| 63. | 1948 | CHATTERJEE, S. C., D.Sc., Professor and Head of the Department of Geology, Science College, Patna University, Patna 5. | |
| 64. | 1955 | CHATTERJEE, S.D., D.Sc. (Cal.), Sen. Mem. I.R.E.(U.S.A.), Professor of Physics, Jadavpur University; 91 Ballygunge Place, Calcutta 19. | |
| 65. | 1951 | CHATTOPADHYAY, K. P., M.Sc (Cantab), Professor & Head of the Department of Anthropology, University College of Science ; 2 Palm Place, Ballygunge, Calcutta 19. | |
| 66. | 1950 | CHAUDHURI, R. N., M.B., F.R.C.P. (Edin.), T.D.D. (Wales), F.S.M.F., Director, School of Tropical Medicine, Chittaranjan Avenue, Calcutta 12. | |
| 67. | 1935 | CHOPRA, B. N., D.Sc., F.N.A.Sc., F.L.S., 73 Ring Road, Lajpatnagar III, New Delhi 14. | |
| 68. | F | CHOPRA, R. N., M.D., Sc.D., F.A.S., F.R.C.P., Brevet-Col., I.M.S (R), Honorary Scientific Adviser, Regional Research Laboratory, Koti Bagh, Srinagar; (Canal Road, Jammu Tawi). | V.P. 1937-1938 Pres. 1939-1940* Ad. V.P. 1948* |
| 69. | 1938 | CHOWDHURY, J. K., M.Sc., D.Phil. (Berlin), 50/U Gorcha Road, Calcutta 19. | |
| 70. | 1940 | CHOWDHURY, K. AHMAD, B.A., B.Sc., M.Sc., D.Sc., Professor of Botany, Aligarh University, Aligarh. | |
| 71. | F | CHOWLA, S., M.A., Ph.D., Visiting Professor of Mathematics, University of Kansas, Lawrence, Kansas, U.S.A. | |
| 72. | 1946 | COATES, J., A.R.S.M., F.G.S., Wildflower House, Shobdon Leominster, Herefordshire, England. | |
| 73. | 1938 | ‡CROOKSHANK, H., C.I.E., B.A., B.A.I., D.Sc., c/o Grindlays Bank Ltd., 54 Parliament Street, London | |

| Serial No. | Year of election | Service on Council | |
|------------|------------------|--|----------------------------------|
| 74. | 1943 | DAS, A. K., D.Sc., M.Sc., F.R.A.S., Deputy Director-General of Observatories in India, Astrophysical Observatory, Kodaikanal, S. India. | |
| 75. | 1951 | DAS GUPTA, C. R., M.B., D.T.M. (Cal.), 1/25 Prince Golam Mohammad Road, Kalighat, Calcutta 26. | |
| 76. | 1958 | ‡DAS GUPTA, N. N., Ph.D., Professor of Biophysics, Institute of Nuclear Physics, Calcutta University ; 44 Hazra Road, Calcutta 19. | |
| 77. | 1958 | DAS GUPTA, S. N., Ph.D., D.I.C., D.Sc., Member, Public Service Commission, West Bengal, Calcutta. | |
| 78. | 1948 | DASTUR, J. F., M.Sc., D.I.C., Scarsdale, Panday Road, Colaba, Bombay 5. | |
| 79. | F | DASTUR, R. H., M.Sc., 52 Mall, Mhow (M.P.). | |
| 80. | 1938 | DATTA, S., D.Sc., F.R.S.E., M.R.C.V.S., D.T.V.M., Lt.-Col., 12/2 Old Ballygunge Second Lane, Calcutta 19. | |
| 81. | 1957 | DEB, S., Dr. e's Sc. (Sorbonne), Professor and Head of the Department of Geological Sciences, Jadavpur University, Jadavpur, Calcutta 32. | |
| 82. | 1942 | DESAI, R. D., D.Sc. (Lond.), D.I.C., F.R.I.C., L. D. Arts College and M. G. Sciences Institute, Navarangpura, Ahmedabad 9. | |
| 83. | 1959 | DESHPANDE, D. L., M.Sc. (Mech.), Director of Technical Education, Bihar & Director, Bihar Institute of Technology, P.O. Sindri Institute, Dhanbad, Bihar. | |
| 84. | 1952 | DESSAU, G., Dr. Ing. (Mining), "Charge de Cours" Mineral Deposits, Instituto Geologia Universita, via S. Maria 31, Pisa, Italy. | |
| 85. | F | ‡DHAR, N. R., D.Sc. (Lond. & Paris), F.R.I.C., F.N.A.Sc., F.M.F.A.A., I.E.S. (R.), Director, Sheila Dhar Institute of Soil Science, University of Allahabad, 2 D Beli Road, Allahabad. | Ad. V.P. 1951; Ad. Mem. 1950. |
| 86. | 1941 | DIKSHIT, B. B., M.B.B.S., (Bombay), Ph.D. (Edin.), M.R.C. P. (Edin.), F.R.S. (Edin.), D.P.H. (Cal.), Director, All-India Institute of Medical Sciences, Ansari Nagar, New Delhi 16. | |
| 87. | 1954 | DIXIT, K. R., Ph.D., 69 Marine Drive, Bombay 1. | Mem. 1956-1958. |
| 88. | 1957 | DOSS, K. S. G., M.Sc., (Mysore), D.Sc., (Madras), F.R.I.C., F. Inst. P., F.A.Sc., Director, Central Electrochemical Research Institute, Karaikudi-3 (S. Rly.). | |

| Serial No. | Year of election | Address | Service on Council |
|------------|------------------|---|------------------------------|
| 89. | 1935 | †DUTT, S. B., D.Sc., D.I.C., F.R.I.C., 2/9 Roop Nagar, Delhi 6. | Ad. Mem. 1938. |
| 90. | 1948 | DUTTA, A. K., D.Sc., Mayurbhanj Professor of Physics, Utkal University, Ravenshaw College, Cuttack 3. | |
| 91. | 1948 | DUTTA ROY, R. K., Dr. Ing., Chemist, Geological Survey of India, 27 Chowringhee Road, Calcutta 13. | |
| 92. | 1943 | ELWIN, VERRIER, M.A., D.Sc. (Oxon), F.A.S., Adviser for Tribal Affairs, NEFA, Manipur and Tripura, Sridham, Nongthymmai, Shillong. | Mem. 1946-1948 1954-1955. |
| 93. | 1957 | ESH, G. C., M.Sc., Ph.D. (Ohio), F. Sigma XI (USA), Officer-in-charge, Dept. of Biochemistry and Nutrition, Bengal Immunity Research Institute, 39 Lower Circular Road, Calcutta 16. | |
| 94. | F | EVANS, P., M.A., F.G.S., 'Tipam', 30 Meadow, Berkhamsted, Herts, England. | |
| 95. | 1955 | FINCH, G. I., F.R.S., Two Trees Farm House, Upper Heyford, Oxfordshire, England. | |
| 96. | 1946 | GANAPATHI, K., D.Sc., Superintendent Research, Hindustan Antibiotics (Private) Ltd., Pimpri (near Poona). | |
| 97. | 1955 | GANJU, P. N., M.Sc., Ph.D. (Lucknow), Ph.D. (Durham), A.M.I.Min.E., F.G.S., Professor and Head of the Department of Geology, Muslim University, Aligarh. | |
| 98. | 1935 | †GEE, E. R., M.A., F.G.S., Director, Geological Survey of Pakistan, Post Box No. 15, Quetta (West Pakistan). | |
| 99. | 1950 | GHATAGE, V. M., M.Sc., D.Phil. (Gottingen), A.F.R.Ae.S. (Lond.), M.I.Ae.Sc. (U.S.A.), F.A.Sc., M.I.E. (Ind.) M.Ae. S.I., Chief Designer and Dy. General Manager (Aircraft), Hindustan Aircraft Ltd., Bangalore. | |
| 100. | 1942 | GHOSH, B. N., D.Sc. (Lond.), Professor of Chemistry, University College of Science, 92 Upper Circular Road, Calcutta 9. | |
| 101. | 1955 | GHOSH, C. S., M.Sc.(Cal.), S.M. (M.I.T.), M.I.E.E., A.I.E.E., F.R.S.A., Professor and Head of Electrical Engineering Department, University of Roorkee, Roorkee. | Mem. 1958- |
| 102. | 1936 | GHOSH, J., M.A., Ph.D., 9, Satyen Datta Road, Calcutta 29. | |
| 103. | 1941 | GHOSH, P. K., M.Sc., D.I.C., D.Sc. (Lond.), Atomic Energy Department, Central Secretariat, North Block, New Delhi. | |
| 104. | 1954 | GHOSH, SATYESHWAR, D.Sc., Professor & Head of the Department of Chemistry, Allahabad University, Allahabad. | Ad. Mem. 1955-1956 |

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|------------|------------------|---|
| 105. | 1951 | GHOSH, SUDDHODAN, D.Sc., Lecturer in pure Mathematics, Calcutta University, Darbhanga Building, College Street, Calcutta 12. |
| 106. | 1945 | ‡GHOSH, SUDHAMOY, D.Sc., F.R.I.C., Emeritus Professor, Calcutta School of Tropical Medicine ; 15A Justice Chunder Madhab Road, Calcutta 20. |
| 107. | 1955 | GHOSH, T. N., D.Sc. (Dacca), Research Officer, Department of Chemistry, Bengal Immunity Research Institute, 39 Lower Circular Road, Calcutta 16. |
| 108. | 1941 | GHURYE, G.S., M.A., Ph.D., Professor of Sociology, University of Bombay, Fuller Road, Bombay. |
| 109. | 1945 | ‡GILL, P. S., M.S., Ph.D. (Chicago), F.A.P.S., Professor of Physics, Muslim University, Aligarh. Mem. 1954-1956 Ad. 1957; 1958- |
| 110. | F | GLENNIE, E. A., C.I.E., G.C.S.I., D.S.O., Brigadier, Seaton House, Shrublands Road, Berkhamsted, Herts, England. Mem. 1946 |
| 111. | 1959 | GOVINDACHARI, T. R., M.Sc., Ph.D., Chief Professor of Chemistry, Presidency College, Madras. |
| 112. | 1953 | GOVINDASWAMY, M. V., M.A., B.Sc., M.B.B.S., D.P.M. (Eng.), F.A.Sc., Director, All-India Institute of Mental Health and ex-officio Superintendent, Mental Hospital, Bangalore 2. |
| 113. | F | ‡GRAVELY, F. H., D.Sc.. 95 Northcourt Avenue, Reading, England. Mem. 1935-1938, 1942-1943. |
| 114. | 1951 | GREVAL, S. D. S., B.Sc., M.D., Ch.B., P.D.H., Lt.-Col., I.M.S. (R), 166 Lower Circular Road, Calcutta 14. |
| 115. | 1941 | GUHA, B. C., D.Sc., Professor of Applied Chemistry, Calcutta University : 55/5 Manoharpukur Road, Calcutta 29. Trea. 1946 (Jan.-July). Mem. 1943-1944, 1947-1948, 1950-1952, 1955-1957, 1959- |
| 116. | F | GUHA, B. S., M.A., A.M., Ph.D., F.A.S., Director, Bihar Tribal Research Institute, Ranchi. Ad. Mem. 1949, 1955. Trea. 1938-1942 Mem. 1943-1944. |
| 117. | 1935 | GUHA, P. C., D.Sc., P. 536, C.I.T. Scheme XLVII, Raja Basanta Roy Road Extension, Calcutta 29. |
| 118. | 1956 | GULATEE, B. L., M.A. (Cantab.), F.R.I.C.S., M.I.S., Glenthorne, Happy Valley, Mussoorie. |
| 119. | 1950 | GUPTA, HANSRAJ, Ph.D., Professor and Head of the Department of Pure Mathematics, Panjab University, Chandigarh. |
| 120. | 1945 | GUPTA, J. C., M.B. (Cal.), 58 B Ritchi Road, Ballygunge, Calcutta 19. |

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| 121. | 1951 | GUPTA, S., M.Sc., Professor of Physics, Indian Institute of Technology, Kharagpur. |
| 122. | 1948 | HEILIG, ROBERT, M.D., Consulting Physician, Jaipur H.O., Rajasthan. |
| 123. | F | HUSAIN, M. AFZAL, M.A. (Cantab.), M.Sc., D.Sc. (Pj.), LL. D. (Hon. Toronto),51/3 Lawrence Road, Lahore, Pakistan. Mem. 1935-1940;1944 1946; Ad. V.P.1941 1947. |
| 124. | 1957 | ‡Huzurbazar, V. S., M. A., Ph.D. (Cantab), F.S.S., Professor and Head of the Department of Mathematics and Statistics, University of Poona, Poona 7. |
| 125. | 1940 | ISHAQ, M., M.A., M.Sc., Ph.D., D.I.C., F. Inst. P., West Regional Laboratories of the Pakistan Council of Scientific and Industrial Research, Ferozepur Road, Lahore. Mem. 1942-1943 |
| 126. | F | IYENGAR, M.O.P., M.A., Ph.D., F.L.S., F.A.Sc., F.B.S., 100 V.R. Pillai Street, Triplicane, Madras. |
| 127. | 1951 | IYER, P. V. KRISHNA, M.A., D.Phil. (Oxon), Senior Scientist, Defence Science Organization, N.P.L. Building, Hillside Road, New Delhi 12. |
| 128. | 1949 | JACOB, K., D.Sc., F.G.S., UNESCO c/oF.A.O. Forestry Mission S.P.V.E.A., CAIXA. Postal No.874 Belem (Para) Brazil. |
| 129. | 1957 | JANAKI AMMAL, E. K., M.A., M.Sc., F.L.S., Director, Central Botanical Laboratory, Botanical Survey of India, 10 Chatham Lines, Allahabad. |
| 130. | 1954 | JHINGRAN, A. G., Ph.D., Deputy Director, Geological Survey of India, 27 Chowringhee, Calcutta 13. |
| 131. | 1950 | JOB, T. J., D.Sc., F.Z.S.I., F.A.S., F.A.Z., Regional Fisheries Officer, FAO of the United Nations, 7 Sharia Lazogli Garden City, Cairo, U.A.R. |
| 132. | 1956 | JOHRI, B. M., D.Sc., Reader in Botany, University of Delhi, Delhi 8. |
| 133. | 1938 | JOSHI, A. C., D.Sc., Vice-Chancellor, Panjab University, Chandigarh, Punjab. Mem. 1949-1951,1953-1955. |
| 134. | 1945 | JOSHI, S. S., D.Sc. (Lond.), F.R.I.C. (Lond.), F.A.Sc., Principal, College of Science and Professor & Head of the Department of Chemistry, Banaras Hindu University, Varanasi 5. |
| 135. | 1946 | KADAM, B. S., Ph.D., Joint Director, Agriculture (Extension), Bombay State, Poona 1. |
| 136. | F | KAPUR, S. N., c/o Kinlab (Private) Ltd., 5 Marquis Street, Calcutta 16. |

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| 137. | 1946 | KHANOLKAR, V. R., M.D. (Lond.), Director, Indian Cancer Research Centre and Hon. Director of Laboratories, Tata Memorial Hospital, Parel, Bombay 12. | Mem. 1952-1954. 1956-1957 : V.P. 1958- |
| 138. | 1944 | KHASTGIR, S. R., Ph.D., D.Sc., F.R.S.E., Khaira Professor & Head of the Department of Physics, University College of Science, 92 Upper Circular Road, Calcutta 9. | |
| 139. | 1951 | KHOSLA, A. N., B.A. (Hons.), C.E., Dr. Eng. (Hon.), I.S.E. (Retd.), M.P., Vice-Chancellor, Roorkee University, Roorkee, U.P. | |
| 140. | 1935 | KICHLU, P. K., D.Sc., Professor of Physics, Delhi University, Delhi 8. | Mem. 1957- |
| 141. | 1954 | KILPADY, SRIPADRAO, M.Sc., F.G.S., University Professor and Head of the Department of Geology, Nagpur University, Amravati Road, Nagpur | |
| 142. | 1946 | #KOSAMBI, D. D., S.B.(Harvard), Professor of Mathematics, Tata Institute of Fundamental Research, Apollo Pier Road, Bombay 1. | |
| 143. | 1936 | KOTHARI, D. S., M.Sc., Ph.D., Professor and Head of the Department of Physics, Delhi University, 5 University Road, Delhi 8. | Trea. 1953-1956; V.P. 1957-1958; Mem. 1942-1944. 1952 F.Sec. 1945 : Sec. 1946-1951. Mem. 1959- |
| 144. | F | KRISHNA, S., Ph.D., D.Sc., 88 Rajpur Road, Dehra Dun. | Mem. 1948-1950 : Govt. Rep. 1953. |
| 145. | F | KRISHNAN, K. S., D.Sc., LL.D., F.R.S., For. Assoc. Nat. Acad. Sc. (U.S.A.), Director, National Physical Laboratory, New Delhi 12. | Mem. 1935-1938. 1947 1948 : Mem. & Ad. V.P. 1949 ; & V.P. 1949 Ad. V.P. 1941-1943 V.P. 1950-1951 : Pres. 1953-1954; |
| 146. | F | KRISHNAN, K. V., M.B.B.S., L.R.C.P., D.Sc., c/o W.H.O., P.O. Box No. 5, Kabul, Afghanistan. | Ad. Mem. 1935-1939 |
| 147. | 1935 | #KRISHNAN, M. S., A.R.C.S., Ph.D., D.I.C., Professor of Geology and Geophysics, Andhra University, Waltair, | Ad. Mem. 1943 : Mem. 1939-1941 : 1954-1956 ; Ad. V.P. 1956. |
| 148. | 1950 | KRISHNAN, R. S., M.A., D.Sc. (Madras), Ph.D. (Cantab), F. Inst. P., F.A.Sc., Professor and Head of the Department of Physics, Indian Institute of Science, Bangalore 12. | Mem. 1955-1957. |
| 149. | 1948 | KRISHNASWAMI, K. R., D.Sc., F.R.I.C., Professor of General Chemistry, Indian Institute of Science, Bangalore 12. | |
| 150. | 1954 | KUMAR, L.S.S., M.Sc., A.R.C.S., D.I.C., Principal and Additional Director of Agriculture (Research), Agricultural College, Vellayani, Kerala State. | |
| 151. | 1945 | KUNDU, B. C., Ph.D. (Leeds), F.L.S., Director, Jute Agricultural Research Institute, Indian Central Jute Committee, Barrackpore, West Bengal. | Ad. Mem. 1589 |

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| 152. | 1958 | LAHIRI, D. B., M.Sc., Chief, National Survey Department of Indian Statistical Institute, 203 Barrackpore Trunk Road, Calcutta 35. | |
| 153. | 1951 | LAL, K. B., Ph.D., Plant Protection Adviser to the Government of India, Director of Plant Protection, Quarantine and Storage, 4/19 Ajmerigate Extension, New Delhi. | |
| 154. | 1936 | LAW, S. C., M.A., B.L., Ph.D., F.Z.S., M.B.O.U., 50 Kailas Bose Street, Calcutta. | |
| 155. | 1940 | MADHAVA, K. B., M.A., A.I.A., 'Amrutha', 130 Lloyds Road, Cathedral, P.O., Madras. | Ad. Mem. 1945-1946 |
| 156. | 1949 | ‡MAHABALE, T. S., B.A., M.Sc., Ph.D., F.A.Sc., F.N.A.Sc., F.B.S., Professor and Head of the Department of Botany, University of Poona, Ganeshkhind, Poona 7. | |
| 157. | 1945 | MAHADEVAN, C., M.A., D.Sc., F.A.Sc., M.A.I.M.E., Head of the Department of Geology and Geophysics, Erskin College of Natural Sciences & Principal, Andhra University Colleges, Andhra University, Waltair. | Mem. 1952-1953 1957- |
| 158. | F | MAHAJANI, G. S., M.A., Ph.D., Member, Union Public Service Commission, Dholpur House, New Delhi. | |
| 159. | F | MAHALANOBIS, P. C., B.Sc., M.A., D.Sc., F.R.S., Director, Indian Statistical Institute, 204 Barrackpore Trunk Road, Calcutta 35; Hon. Statistical Adviser to the Cabinet, Government of India, 8 King George Avenue, New Delhi 2. | Ad. 'Mem. 1941-1943, 1947-1948; Mem. 1945-1946; Ad. V.P. 1950-1951; F. Sec. 1952-1956; Pres. 1957-1958* |
| 160. | 1935 | MAHESHWARI, P., D.Sc., Professor and Head of the Department of Botany, Delhi University, Delhi 8. | Mem. 1956; Sec. 1957- |
| 161. | 1940 | MAJUMADAR, D. N., M.A., Ph.D., Professor and Head of the Department of Anthropology, Lucknow University, Lucknow. | |
| 162. | 1943 | MAJUMDAR, G. P., M.Sc., Ph.D., F.A.Sc., F.B.S., 19 Ekdalia Place, Ballygunge, Calcutta 19. | Ad. Mem. 1956; Ad. V.P. 1957; Mem. 1958- |
| 163. | 1941 | MAJUMDAR, R. C., Dr. Phil. Nat. Professor of Physics, Delhi University, Delhi 8. | Mem. 1950-1951; Sec. 1952-1956; Ed. 1957- |
| 164. | 1946 | MALHOTRA, D. R., D.Sc., M.I. Chem. E., F.I.M., M.I.E. (India), 'White House', Golf Course Road, Ajmer. | Mem. 1954-1955. |
| 165. | 1956 | MALURKAR, S. L., M.Sc. (Cantab), Director, Colaba and Alibag Observatories, Indian Meteorological Service, Colaba Observatory, Colaba, Bombay 5. | |

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| 166. | 1958 | MANGALIK, V.S., M.D., D.C.P., Professor and Head of the Department of Pathology & Bacteriology, King George's Medical College, Lucknow. | |
| 167. | F | MEHRA, H. R., M.Sc., Ph.D., 33 Chatham Lines, Allahabad. | Ad. V.P. 1942-1943. 1945; Ad. Mem. 1944-1947; Mem. 1949-1950. |
| 168. | I952 | MEHRA, P. N., D.Sc., Professor and Head of the Department of Botany, Panjab University, c/o Khalsa College, Amritsar. | |
| 169. | 1958 | MEHRA, S. R., C.E., M.Inst. C.E., M.I.E., Director, Central Road Research Institute, Delhi Mathura Road, P.O. C.R.R.I., New Delhi 20. | |
| 170. | 1957 | MEHTA, S. M., B.A., M.Sc., A.R.I.C., F.A.Sc., "Godambe Villa," 423 First Road, Khar, Bombay 21. | |
| 171. | 1956 | METRE, W. B., F.G.S. (Lond.), Chief Geologist, Assam Oil Co., Ltd., Digboi. | |
| 172. | 1958 | MINAKSHISUNDARAM, S., M.A., D.Sc., Professor and Head of the Dept. of Mathematical Physics, Andhra University, Waltair. | |
| 173. | 1955 | MISRA, R., M.Sc., Ph.D. (Leeds), F.N.A.Sc., Professor and Head of the Department of Botany, Banaras Hindu University, Varanasi 5. | |
| 174. | 1949 | MITRA, H. K., M.Sc. (Cal.), Ph.D. (Pittsburgh, U.S.A.), Refractories Engineer, Tata Iron & Steel Co., Ltd., 24 Circuit House Area, Jamshedpur. | |
| 175. | 1949 | MITRA, K., M.B., D.P.H., D.T.M. & H., F.S.S., (Eng.), C.I.T. Plot 114, Badan Roy Lane, Calcutta 10. | |
| 176. | 1953 | MITRA, R. P., D.Sc., Professor of Chemistry, Delhi University, Delhi 8. | |
| 177. | 1944 | MITRA, SUBODH, M.B. (Cal.), Dr. Med. (Berlin), F.R.C.S. (Edin.), F.R.C.O.G., F.A.C.S., 4 Chowringhee Terrace, Calcutta 20. | |
| 178. | 1941 | MITRA, S. C., M.A., Ph.D. (Leip.), University Professor and Head of the Department of Psychology, Calcutta University, 92 Upper Circular Road, Calcutta 9. | |
| 179. | F | MITRA, S. K., D.Sc., F.R.S., Emeritus Professor of Physics, Calcutta University, Institute of Radio Physics and Electronics, 92 Upper Circular Road, Calcutta 9. | Mem. 1935-1939. 1947-1949, 1952- 1954, 1956-1957: Ad. V.P. 1949, 1950, 1955, 1958: V.P. 1943-1944: Ad. Mem. 1940- 1942: Pres. 1959- |

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| 180. | 1954 | MODAK, N. V., B.E., M.Inst.C.E., M.I.E. & C., "Udyam", Shivaji Park, Dadar, Bombay 28. |
| 181. | 1948 | MOGHE, M.A., M.Sc., Ph.D., F.Z.S., F.A.Sc., Canal Road, Ramdaspath, Nagpur. Mem. 1959- 1953-1955. |
| 182 | 1943 | MUKERJI, B., D.Sc., M.B., F.P.S., F.A.Ph.S., F.A.A.A.S., F.I.C., Director, Central Drug Research Institute, Chhattar Manzil Palace, Lucknow. Ad. Mem. 1949. 1950-1951: Mem. 1948-1949. 1952-1953. 1956: V.P. 1954-1955: F. Sec. 1957- |
| 183. | F | MUKHERJEE, J. N., D.Sc., F.C.S., F.A.S., 10 Puran Chand Nahar Avenue, Calcutta 13. Mem. 1935-1938: Ad. V.P. 1939-1940, 1952: V.P. 1941-1942. F. Sec. 1943-1944. 1947-1951: Ed. 1945-1946. |
| 184. | 1953 | MUKHERJI, K. C., M. A., Lecturer in Psychology, Calcutta University ; Government Quarters, Block A, Flat 10, Calcutta 14. |
| 185. | 1959 | MUKHERJI, S. M., D.Sc., University Professor and Head of the Department of Chemistry, Punjab University, Hoshiarpur. |
| 186. | 1955 | NAGAPPA, Y., M.Sc., (Mys.), Palaeontologist, Assam Oil Co., Ltd., Digboi, Assam. |
| 187. | 1959 | NAGENDRA NATH, N. S., Professor and Head of the Department of Mathematics, Science College, Patna 5. |
| 188. | 1957 | NAIR, K. R., Ph.D., D.Sc., Joint Director (Standards) Central Statistical Organization, Cabinet Secretariat 'B' Barracks, Janpath, New Delhi. |
| 189. | 1945 | NAIR, U. S., M.A. Ph.D. (Lond.), Head of the Department of Statistics, Kerala University, Trivandrum. |
| 190. | 1959 | NANJUNDAYYA, C., M.Sc., Ph.D. (Manch.), F.T.I., Joint Director, The Bombay Textile Research Association, 'Jyoti', 287 Sion Road (East), Bombay 22. |
| 191. | 1946 | NARAYANA, BASUDEVA, M.Sc., M.B., Ph.D., F.R.S.E., Principal and Professor of Physiology S.R.M. Medical College, Kakinada (Andhra Pradesh). |
| 192. | 1940 | NARAYANAMURTI, D., B.Sc., (Mys.), M.Sc. (Bom.), Dr. Ing. (Danzig), A.I.I.Sc., F.R.I.C., F. Inst. P., M.I. Chem.E., Chief Research Officer, Composite Wood Branch, Forest Research Institute, New Forest, Dehra Dun. |
| 193. | 1958 | NARAYANAN, E.S., Ph.D., D.I.C., F.R.E.S., F.E.S.I., F.A.Sc., Head of the Division of Entomology, Indian Agricultural Research Institute, New Delhi 12 ; Principal, Central College of Agriculture, Dean, Faculty of Agriculture and Forestry, University of Delhi. |

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| 194. | 1939 | NARLIKAR, V. V., B.Sc. (Bom.), M.A. (Cantab), F.R.A.S., Professor of Mathematics and Head of the Department, Banaras Hindu University, Varanasi 5. | Mem. 1942-1944. |
| 195. | 1950 | NATH, M. C., D.Sc., F.R.I.C., F.I.C., Chitnavis Professor and Head of the University Department of Bio-chemistry, Nagpur University, Nagpur. | |
| 196. | 1943 | NATH, RAJ, Ph.D., D.I.C., University Professor and Head of the Department of Geology, Banaras Hindu University, Varanasi 5. | |
| 197. | 1940 | NATH, VISHWA, Sc. D. (Cantab) University Professor & Head of the Department of Zoology, Panjab University, P. B. No. 4, Hoshiarpur. | |
| 198. | 1947 | NEHRU, THE HON'BLE PANDIT JAWAHARLAL, Prime Minister of India, New Delhi. | |
| 199. | 1957 | NIJHAWAN, B. R., Ph.D., F.I.M., Padma Shri, Director, National Metallurgical Laboratory, Jamshedpur 7. | |
| 200. | F | ‡NORMAND, SIR CHARLES W. B., Kt., C.I.E., M.A., D.Sc., c/o Midland Bank, Gloucester Road, London, S.W. 7. | Mem. 1953-1940 1944: V.P. 1941-1942. |
| 201. | 1946 | PAL, B. P., M.Sc., Ph.D. (Cantab), F.L.S., F.B.S., Director, Indian Agricultural Research Institute, New Delhi 12. | Mem. 1951, 1957-Trea. 1952; Sec. 1953-56. |
| 202. | 1956 | PAL, R. K., M.B. (Cal.), D.Sc. (Edin.), M.R.C.P., F.R.S.E., 5/4 Ballygunge Place, Calcutta 19. | |
| 203. | 1953 | PALIT, S. R., D.Sc., F.R.I.C., Professor and Head of the Department of Physical Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta 32. | |
| 204. | 1959 | PANDE, S. K., M.Sc., D.Sc., F.B.S., Professor, National Botanic Gardens, Lucknow. | |
| 205. | 1939 | PANDIT, C. G., M.B.B.S., Ph.D., D.P.H., D.T.M.. Director, Indian Council of Medical Research, C-II type Flat No. 16, Medical Enclave, Near Safdarjang Hospital, New Delhi 16. | Govt. Rep. 1945, 1948-1952; Mem. 1948; Trea. 1949-1951. |
| 206. | 1952 | ‡PANIKKAR, N. K., M.A., D.Sc., F.A.Sc., F.N.A.Sc., Fisheries Development Adviser, Ministry of Food and Agriculture Multi-storeyed Building : Queen Victoria Road, New Delhi. | |
| 207. | 1944 | PANJA, G. M B. (Cal.), D.Bact. (Lond.), F.D.S. (Lond), Director, Indian Institute of Dermatological Research Vivekananda Road, Calcutta 6. | |
| 208. | 1946 | PANSE, V. G., Ph.D., Statistical Adviser, Indian Council of Agricultural Research, New Delhi 12. | Mem. 1951-1952. |

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| 209. | 1937 | PARANJPE, G. R., M.Sc., A.I.I.Sc., O.B.E., I.E.S. (R.), 'Sudarshan', 1159 Sadashiv, Poona 2. Mem. 1939-1942; 1949-1950. |
| 210. | F | PARANJPYE, R. P., D.Sc., D.Litt., Purushottam Ashram, Poona 4. Mem. 1940-1943 |
| 211. | F | PARIJA, P., Padmabhushan, M.A. (Cantab), D.Sc., I.E.S. (R.), Vice-Chancellor, Utkal University ; 10 Cantonment Road, Cuttack 1. 1947-1948 1950 Ad. Mem. 1939 V. P. 1951-1952 Ad. V.P. 1959- |
| 212. | 1949 | PARTHASARATHY, N., B.Sc. (Ag.), Ph.D. (Lond.), FAO Regional Rice Improvement Specialist, F.A.O. of U.N. Regional Office for Asia and the Far East Malliwan Mansions, Phra Atit Road, Bangkok, Thailand. |
| 213. | 1958 | PATWARDHAN, V.N., Ph.D., A.I.I.Sc., Director, Nutrition Research Laboratories, Indian Council of Medical Research, Post Box No. 3, Coonoor. |
| 214. | 1936 | PERCIVAL, F. G., O.B.E., Ph.D., F.G.S., Sadlers End, Haslemere, Surrey, England. Mem. 1941-1943- |
| 215. | 1958 | PETERS, B., Ph.D., Professor of Experimental Physics, Tata Institute of Fundamental Research, Apollo Pier Road, Bombay 1. |
| 216. | 1942 | PICHAMUTHU, C. S., Ph.D., D.Sc. (Glasgow), F.R.S.E., F.G.S., Professor of Geology, University of Malaya, Cluny Road, Singapore, Malaya. |
| 217. | 1958 | PRASAD, B., D.Sc., Vice-Chancellor, Patna University, Patna. |
| 218. | 1936 | PRASAD, B. N., Dr. e's Sc. (Paris), Ph.D. (Liverpool), Professor and Head of Mathematics Department, Allahabad University ; Lakshmi Niwas, George Town, Allahabad 2. Ad. Mem. 1953-1954 1957-Mem. 1945- |
| 219. | 1935 | PRASAD, MATA, D.Sc., F.R.I.C., Vice-Chancellor, Vikram University, Ujjain. (M.P.) Mem. 1948-1949, 1951-1952, 1955-1957. |
| 220. | F | PRASHAD, BAINI, D.Sc., F.A.S., 10 Dobhwala Road, Dehra Dun. Mem. Ed. 1935-1939 Ad. V.P. Ed. 1949; Pres. 1941-1942.* |
| 221. | F | PRUTHI, HEM SINGH, O.B.E., Sc.D., (Cantab), F.A.S., 14/4 Northern Extension, Uttri Marg, New Delhi. Mem. 1945-1946. 1953-54; Sec. 1947-1952. |
| 222. | 1957 | PURI, V., D.Sc., F.A.Sc., School of Plant Morphology, Meerut College, Meerut. |
| 223. | 1949 | RACINE, C., S.J., D.Sc. (Paris), Professor of Mathematics, Loyola College, Madras 31. |
| 224. | 1953 | RAIZADA, M.B., M.Sc., Chief Research Officer, Botany Branch and Head, Division of Forest Botany, Forest Research Institute, P.O. New Forest, Dehra Dun. |

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| 225. | 1935 | ‡RAJ, B. SUNDARA, Diwan Bahadur, M.A., Ph.D., "The Anchorage", Kottur, Madras 25. | |
| 226. | 1948 | RAJU, S. P., B.E., Dr.Ing., M.I.E., 'Hill View', Red Hills, Hyderabad (Deccan). | |
| 227. | 1943 | RAKSHIT, H., D.Sc., F. Inst. P., Head of the Department of Electronics and Electrical Communication Engineering Indian Institute of Technology, Kharagpur. | |
| 228. | 1955 | RAMAMURTI, B., M.A., D.Sc., Regional Statistical Adviser, ECAFE United Nations, Bangkok. | |
| 229. | 1959 | RAMANATHAN, K. G., M.A., Ph.D., School of Mathematics, Tata Institute of Fundamental Research, Bombay 1. | |
| 230. | F | RAMANATHAN, K. R., M.A., D.Sc., Physical Research Laboratory, Navarangpura, Ahmedabad. | Mem. 1942-1944 V.P. 1955-1956. |
| 231. | 1948 | RAMANUJAM, S., M.A., Ph.D. (Lond.), Director of Agricultural Research, Govt. of Bihar, Patna. | |
| 232. | 1957 | RAMASWAMI, L. S., D.Sc., F.Z.S., Reader in Zoology, Central College, Bangalore 9. | |
| 233. | 1935 | ‡RAMDAS, L. A., M.A., Ph.D., Head of Heat and Power Division, National Physical Laboratory, Hillside Road, New Delhi 12 | Mem. 1945-1947, 1950-1952. |
| 234. | 1942 | RAMIAH, K., D.Sc., "Swathi", 552 XIX Cross Road, Malleswaram P. O., Bangalore 12. | |
| 235. | 1943 | RANDHAWA, M. S., D.Sc., I.C.S., Vice-President, Indian Council of Agricultural Research and Additional Secretary, Ministry of Food and Agriculture, Govt. of India, Queen Victoria Road, New Delhi. | Trea. 1948; Mem. 1947, 1959- |
| 236. | 1951 | RANJAN, SHRI, D.Sc., Vice-Chancellor, Allahabad University, Allahabad. | Ad. V.P. 1954-1955, 1958- |
| 237. | F | RAO, B. RAMA, M.A., D.I.C., F.G.S., 291 Srivilas, Visvesvarapur, Bangalore 4. | |
| 238. | 1944 | RAO, B. SANJIVA, M.A., Ph.D., D.Sc. (Lond.), Professor of Chemistry, Gauhati University, Jhalukbari, Kamrup Dist. Assam. | |
| 239. | 1953 | RAO, B. S. MADHAVA, D.Sc., Professor, Institute of Armament Studies, Kirkee, Poona 3. | |
| 240. | 1954 | RAO, C. RADHAKRISHNA, M.A., Ph.D., Professor and Head of the Division of Theoretical Research and Training, Indian Statistical Institute, 203 Barrackpore Trunk Road, Calcutta 35. | |

| Serial No. | Year of election | Service on Council |
|------------|------------------|--|
| 241. | 1937 | RAO, H. SRINIVASA, M.A., D.Sc., F.A.S., F.Z.S.I., 4/86 East Cross Road, No. 22 Katpadi Extension P. O., North Arcot Dist. (Madras). |
| 242. | 1937 | RAO, K. RANGADHAMA, D.Sc., (Madras and London), Principal, College of Science and Professor of Physics, Andhra University, Waltair. |
| 243. | 1939 | RAO, L. RAMA, M.A., F.G.S., Former Professor of Geology, University of Mysore ; "Shantiniketan", Basavangudi, Bangalore 4. |
| 244. | 1945 | RAO, M. V. RADHAKRISHNA, M.B., B.S., Ph.D. (Andhra), Assistant Director, Haffkine Institute, Parel, Bombay 12. |
| 245. | 1948 | RAO, S. RAMACHANDRA, Ph D., D.Sc., Professor of Physics, Sri Venkateswara University, Tirupati (Andhra). |
| 246. | 1951 | RAO, S. R. NARAYAN, M.A., Director of Geology and Mining, U.P., 2 Way Road, Lucknow. |
| 247. | 1957 | RAO, T. RAMACHANDRA, D.Sc., Deputy Director of Public Health (Malaria & Filaria), Bombay State, Connaught House, Poona 1. |
| 248. | 1950 | RAY, H. N., Ph.D., Professor of Protozoology, School of Tropical Medicine, Calcutta 12. |
| 249. | 1948 | RAY, J. C., M.D., Director, Indian Institute for Biochemistry and Experimental Medicine, P 27 Prinsep Street, Calcutta 13. Mem. 1959. |
| 250. | 1935 | RAY, J. N., D.Sc., Ph.D., F.R.I.C., c/o Sri A. Basu, National Tower (Ground Floor), 13 Loudon Street, Calcutta 16. |
| 251. | 1958 | RAY, M., D.Sc., Professor of Mathematics, Agra College, Agra. |
| 252. | F | RAY, P., M.A., 50/1 Hindusthan Park, Ballygunge, Calcutta 29. Mem. 1943-1945. |
| 253. | 1943 | RAY, R. C., D.Sc. (Lond.), F.R.I.C., F.I.I.Sc., Emeritus Professor of Chemistry, Science College, Patna; B. M. Das Road, Bankipore, Patna 4. |
| 254. | 1956 | RAYCHAUDHURI, SACHI P., M.Sc., Ph.D. (Edin.), University Lecturer in Zoology, Calcutta University, 35 Ballygunge Circular Road, Calcutta 19. |
| 255. | 1952 | RAYCHAUDHURI, S. P., M.Sc. (Cal.), Ph.D. (Lond.), D.Sc. (Cal. & Lond.), F.R.I.C., Chief Soil Survey Officer, All India Soil and Land Use Survey, Indian Agricultural Research Institute, New Delhi 12. |

| Serial No. | Year of election | Service on Council |
|------------|------------------|---|
| 256. | 1945 | ‡ROONWAL, M. L., M.Sc., Ph.D. (Cantab), Director, Zoological Survey of India, 34 Chittaranjan Avenue, Calcutta 12. |
| 257. | 1954 | ROY, A. K., B.Sc., (Cal.), B.A. (Oxon.), Officer-in-charge, Rain and Cloud Physics Research, National Physical Laboratory, Hillside Road, New Delhi 12. |
| 258. | 1957 | ROY, B. C., A.I.S.M., D.I.C. (Lond.), M.Sc. (Lond.), Dr. Ing. (Freiberg), Director, Geological Survey of India, 27 Chowringhee Road, Calcutta 13. |
| 259. | 1940 | ROY, S. C., F.R.Met.Soc. (Lond.), H-14 Kailas Colony, P.O. Jungpura Extension, New Delhi 14. |
| 260. | 1940 | ROY, S. K., Ph.D., In-charge of Development of Coal Mines, Dabar Colliery, P.O. Shamdih, Dist. Burdwan (<i>via</i> Sitarampur), E. Ry. |
| 261. | 1944 | ROY, S. N., M.Sc., Institute of Mathematics and Statistics, University of N. Carolina, Chapel Hill, N.C., U.S.A. |
| 262. | 1955 | SADASIVAN, T. S., D.Sc. (Lond), F.A.Sc., Director, University Botany Laboratory, Madras 5. Mem. 1958- |
| 263. | 1959 | SAHA, A. K., D.Sc. (Edin.), Professor of Nuclear Physics, Institute of Nuclear Physics, Calcutta; 125 Southern Avenue, Calcutta 29. |
| 264. | 1957 | SAHA, N. K., M.Sc., Dr. Nat. (Heidelberg), Reader in Physics, Delhi University, Delhi 8. |
| 265. | 1950 | SAHNI, M. R., M.A., D.I.C., Ph.D., D.Sc., Hon. Fellow, Palaeontological Society U.S.S.R., Professor of Geology, Punjab University, Chandigarh. |
| 266. | 1952 | SAKSENA, R. K., D.Sc., 1 B Beli Road, Allahabad 2. Ad. Mem. 1953-1954. |
| 267. | 1953 | SANTAPAU, H. (Rev.), S. J., Ph.D., Director, Biological Section, St. Xavier's College, Fort, Bombay. |
| 268. | 1935 | SARKAR, P. B., Dr. e's Sc., A.I.C., Ghose Professor of Chemistry, Calcutta University, 92 Upper Circular Road, Calcutta 9. |
| 269. | 1946 | SARKAR, P. B., D.Sc., (Dacca), Director of Technological Research Laboratories, Indian Central Jute Committee; P. 133 B Lake Terrace, Calcutta 29. |
| 270. | 1959 | SARKAR, S. S., D.Sc., 16/2/E Station Road, Calcutta 19. |

| Serial No. | Year of election. | Service on Council |
|------------|-------------------|---|
| 271. | 1941 | SAVUR, S. R., M.A., L.T., Ph.D., Dilkush, North Avenue, Santa Cruz (West), Bombay 23. |
| 272. | 1955 | SEAL, S. C., M.B.B.S. (Cal.), D.P.H. (Cal.), Ph.D. (Bombay), Hon. F.A.P.H.A.(U.S.A.), Professor of Epidemiology, All India Institute of Hygiene and Public Health, 110 Chittaranjan Avenue, Calcutta 12. |
| 273. | 1952 | SEN, B., D.Sc., Professor of Mathematics, Jadavpur University, Calcutta 32. |
| 274. | F | SEN, B. M., M.A., M.Sc., I.E.S. (R.), 12 Ballygunge Circular Road, Ballygunge, Calcutta 19. |
| 275. | 1949 | †SEN, K. C., D.Sc., 403 Jodhpur Park, Calcutta 31. |
| 276. | 1951 | SEN, N. K., D.Sc. (Dacca), F.R.I.C., 22/3 H. Sreenath Mukherji Lane, Calcutta 30. |
| 277. | F | SEN, N. R., Ph.D., D.Sc., 58 A Block D, New Alipore, Calcutta 33. Mem. 1935-1941. 1949-1951. V.P. 1959- |
| 278. | 1954 | SEN, R. N., M.A., Ph.D., Professor of Pure Mathematics, Calcutta University; 30 Mohan Bagan Lane, Block 2, Calcutta 4. |
| 279. | 1954 | SEN GUPTA, M., B.Sc. (Cal.), B.Sc. Hons. (Glas.), C.P.E.. M.I.E.E. (Lond.), M.I.E. (Ind.), M.I. Mech.E. (Lond.), M. Brit. I.R.E. (Lond.), F.R.S.A. (Lond.), F.I.P.S., Professor & Head of the Department of Electrical Engineering & Principal, Engineering College, Banaras, Hindu University, Varanasi 5. |
| 280. | 1953 | SESHACHAR, B. R., D.Sc., Professor and Head of the Department of Zoology, Central College, Bangalore. Mem. 1956-1958 |
| 281. | 1942 | SESHADRI, T. R., M.A., Ph.D. (Manchester), F.R.I.C., F.A.Sc., Professor & Head of the Department of Chemistry, Delhi University, Delhi 8. |
| 282. | 1943 | SETNA, S. B., M.Sc., Ph.D. (Cantab), F.R.M.S., Director of New India Fisheries Ltd., 'Taiyo House', Sassoon Dock, Colaba, Bombay 5. |
| 283. | 1936 | †SEWELL, R. B. SEYMOUR, Lt.-Col., C.I.E., M.A., Sc.D., F.R.S., M.R.C.S., L.R.C.P., F.Z.S., F.L.S., F.A.S., 18 Barrow Road, Cambridge, England. |
| 284. | 1941 | SHAH, R. C., M.Sc., Ph.D. (Lond.), Deputy Director, National Chemical Laboratory, Poona 8. |
| 285. | 1952 | SHAH, S. M., M.A., Ph.D., D.Litt. (Lond.), F.R.S.E., Professor and Head of the Department of Mathematics and Statistics, Muslim University, Marris Road, Aligarh. |

| Serial No. | Year of election | Service on Council |
|------------|------------------|--|
| 286. | 1939 | SHARIF, M., D.Sc., Ph.D., c/o Sh. Muizz-ud-Din, M.A., Lecturer, Central Training College, Lahore, Pakistan. |
| 287. | 1937 | SIDDIQI, RAZIuddin, M.A., Ph.D., Vice-Chancellor, University of Sind, Hyderabad (West Pakistan). Mem. 1941-1943 1946-1947. |
| 288. | 1959 | SIKKA, S. M., B.Sc. (Ag.), Associate I.A.R.I., Ph.D. (Lond.), Addl. Agricultural Commissioner with the Govt. of India, Indian Council of Agricultural Research, Krishi Bhavan, Queen Victoria Road, New Delhi. |
| 289. | F | SINGH, B. K., M.A., Sc.D., (Cantab), F.R.I.C., I.E.S.(Retd.), Sc.D. (Dublin), Organic Chemistry Research Section, Banaras Hindu University, Varanasi 5. Ad. V.P. 1935-1936, 1944-1946; Ad. Mem. 1941, |
| 290. | 1941 | SINGH, B. N., D.Sc., M.Sc., F.N.A.S., F.A.Sc., F.R.H.S., Crop Physiologist to Government, U.P., Director, Institute of Crop Physiology, Dilkusha, Lucknow. |
| 291. | 1952 | SINGH, I., M.B.B.S., Ph.D., L.R.C.P., M.R.C.S., Professor of Physiology, S. N. Medical College, Agra. |
| 292. | 1956 | SINGH, JASWANT, M.B., Ch.B.(Edin.), D.T.M. & H.(Lond), D.P.H. (Eng.), Lt.-Col., Director General of Health Services, North Block, Central Secretariat, New Delhi. |
| 293. | 1954 | SIRCAR, S. M., M.Sc., Ph.D. (Lond.), D.I.C., Reader in Botany, Calcutta University, 35 Ballygunge Circular Road, Calcutta 19. |
| 294. | 1942 | SIRKAR, S. C., D.Sc., M.L.S. Professor of Physics, Indian Association for the Cultivation of Science, Jadavpur, Calcutta 32. |
| 295. | F | SOKHEY, S. S., M.A., M.D., D.T.M. & H., Major-General, I.M.S., c/o Haffkine Institute, Parel, Bombay 12. Mem. 1935-1938, 1946-1947; V.P. 1948-1949. |
| 296. | 1941 | SONDHI, V. P., M.Sc., F.G.S., Chief Geologist and Director of Drilling, N.C.D.C. Ltd., Darbhanga House, Ranchi. |
| 297. | 1950 | SREENIVASAN, A., D.Sc., F.R.I.C., Professor of Food Technology, Department of Chemical Technology, University of Bombay, Matunga Road, Bombay 19. |
| 298. | 1946 | SRIVASTAVA, B. N., D.Sc., Professor of General Physics, Indian Association for the Cultivation of Science, Jadavpur, Calcutta 32. |
| 299. | 1935 | SRIVASTAVA, P. L., M.A., D.Phil. (Oxon.), 7 Lajpat Rai Road, Allahabad. Ad. Mem. 1942-1943, 1945, 1948-1949, 1951-1952, 1958 - Ad. V. P 1944, 1956-1957. |

| Serial No. | Year of election. | Service on Council |
|------------|-------------------|--|
| 300. | F | SUBRAHMANYAN, V., D.Sc., F.R.I.C., Director, Central Food Technological Research Institute, Cheluvamba Mansion, V. V. Mohalla P. O., Mysore. Mem. 1938 1952-1954, 1959- |
| 301. | 1958 | SUBRAMANIAM, A. P., A.M., Ph.D., F.G.S., M.G.S. Am., Petrologist, Geological Survey of India, 27 Chowringhee, Calcutta 13. |
| 302. | 1943 | SUKHATME, P. V., M.Sc. (Lond.), Ph.D., M 64 Connaught Circus, New Delhi. Mem. 1950-1951. |
| 303. | 1938 | SUR, N. K., D.Sc., 74 Tagore Town, Allahabad 2. Mem. 1941-1943 |
| 304. | 1956 | ‡SWAROOP, S., M.A., Ph.D., M.P.H., F.A.P.H.A., Chief Statistician, Health Statistical Methodology. World Health Organization, Palais des Nations, Geneva, Switzerland. |
| 305. | 1942 | TAWDE, N. R., M.Sc., Ph.D. (Lond.), F.Inst.P., Professor of Physics. Karnatak University, Dharwar. Mem: 1953-1955 1957- |
| 306. | 1954 | THACKER, M. S., D.Sc. (Hc.), D.Litt. (Hc.), B.Sc. (Eng.), M.I.E.E. (Lond.), M.I.M. (Lond.), M.Inst.F. (Lond.), M.I.E., M.I.R.E., M.Ind. I.M., M.Elec. Chem. S., F.Am. I.E.E., F.I.A.Sc., Secretary and Educational Adviser (Technical) to the Government of India, Ministry of Scientific Research and Cultural Affairs, and Director General, Scientific and Industrial Research, Old Mill Road, New Delhi 2. Mem.1954-1956; Ad. 'V.P. 1957, & Govt. Rep. 1957- |
| 307. | 1952 | THAPAR, G. S., M.Sc., Ph.D., 14 Mahatma Gandhi Road, Lucknow. |
| 308. | 1956 | THIRUMALACHAR, M. J., D.Sc., Ph.D., Chief Mycologist, Hindustan Antibiotics, Pimpri, Poona. |
| 309. | 1943 | TOSHNIWAL, G. R., D.Sc., S.M.I.R.E., Managing Director, Toshniwal Bros., Private Ltd., "Rival", Kacheri Road, Ajmer. |
| 310. | 1943 | TRIBEDI, B. P., M. B. (Cal.), D. B. (Lond.), F.S.M.F. (W.B.), 11/1 Kyd Street, Calcutta 16. |
| 311. | 1935 | ‡UKIL, A. C., M.B., M.S.P.E. (Paris), F.S.M.F. (Hon. causa), F.C.C.P. (Emeritus), F.A.S., Consulting Physician, Division of Chest Diseases, Calcutta Medical College Hospitals; 57 McLeod Street, Calcutta 16. Mem. 1945-1947, 1949-1951, 1953-1954; Ad. Mem. 1952; Ad. V.P. 1948; Pres. 1955-1956* |
| 312. | 1944 | UPPAL, B. N., Ph.D., Agricultural Commissioner with the Government of India, Indian Council of Agricultural Research, Queen Victoria Road, New Delhi. |

| Serial No. | Year of election | Service on Council |
|------------|------------------|---|
| 313. | 1952 | UPPAL, H. L., M.Sc., Ph.D., Director, Irrigation and Power Research Institute, Punjab, Amritsar. |
| 314. | 1942 | VACHELL, E. T., M.A., (Cantab), F.G.S., F.Inst. Pet., F.S.A., Coley, Lydwell Road, Torquay, Devon, England. |
| 315. | 1953 | VAIDYA, W. M., Ph.D., Assistant Director, National Physical Laboratory, Hillside Road, New Delhi 12. |
| 316. | 1959 | VAKIL, R. J., M.D., M.R.C.P., D.T.M. & H. (Lond.), Roxana, 109 Queen's Road, Bombay 1. |
| 317. | 1949 | VARMA, R. S., D.Sc., Officer-in-Charge, Defence Science Laboratory, N. P. L. Building, New Delhi 12. |
| 318. | 1950 | VASUDEVA, R. S., Ph.D. (Lond.), D.Sc. (Lond.), D.I.C., Joint Director and Head of the Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi 12. |
| 319. | 1939 | VENKATARAMAN, K., M.Sc. Tech., Ph.D., D.Sc., Director, National Chemical Laboratory, Poona 8. Mem. 1943-1945, 1952 - 1953, 1955-1956, 1958- |
| 320. | F | VENKATESACHAR, B., Rao Bahadur, M.A., F.Inst. P., c/o Dr. B. V. Raghavendra Rao, Bungalow No. 12, Indian Institute of Science, Bangalore 12. Mem. 1935-1941. |
| 321. | 1955 | VENKITESWARAN, S. P., B.A.(Hons.), F.A.Sc., A.M.I.T.E., Director (Instruments), Meteorological Office, Poona 5. |
| 322. | 1946 | VERMAN, L. C., B.S. Eng., M.S., Ph.D. (Cornell), F.Inst. P., Director, Indian Standards Institution, 'Manak Bhawan', 9 Mathura Road, New Delhi. |
| 323. | F | VISWANATH, B., D.Sc., F.R.I.C., 'Krishna Nivas', 8-A/85 Western Extension, Pusa Road, New Delhi. Ad. V.P. 1939-1940. |
| 324. | F | WADIA, D. N., M.A., D.Sc. (Hon.), F.R.S., F.G.S., F.A.S., Geological Adviser, Department of Atomic Energy, 10 King George Avenue, New Delhi. Ad. V.P. 1942; V.P. 1943-1944; Pres. 1945-1946* Govt. Rep. 1947. |
| 325. | 1957 | WAHI, P. N., M.D., M.R.C.P. (Lond.), Professor and Head of the Department of Pathology, S. N. Medical College, Agra. |
| 326. | F | WEST, W. D., C.I.E., M.A., Sc.D. (Cantab), F.A.S., Department of Applied Geology, Saugar University, Sagar. (M.P.). Ad. Mem. 1935-1940; Ad. V.P. 1941-1944, 1946, 1949; Sec. 1945 Mem. 1947-1948, 1958- |

| Serial No. | Year of election | | Service on Council |
|------------|------------------|--|--------------------|
| 327. | F | WHEELER, T. S., D.Sc., Ph.D., F.R.C.Sc.I., F.I.C.I., F.R.I.C., F. Inst. P., M. I. Chem. E., M.R.I.A., Professor of Chemistry, University College, Upper Merrion Street, Dublin, Republic of Ireland. | Ad. V.P. 1937 |
| 328. | 1940 | YAJNIK, N. A., M.A., D.Sc., A.R.I.C., Tejpal House, Bomanji Petit Road, Bombay 26. | |

*The three past Presidents who have most recently held office of President shall be *ex-officio* Additional Members of the Council."

†Paid compounding fee for all future subscriptions.

HONORARY FELLOWS

1. 1939 APPLETON, SIR EDWARD V., G.B.E., K.C.B., D.Sc., F.R.S., N.L., Principal and Vice-Chancellor of the University of Edinburgh, The Old College, South Bridge, Edinburgh 8.
2. 1941 BAILEY, SIR E. B., Kt., M.C. D.Sc., L.L.D., F.R.S., 76 Hampstead way, London N. W.11.
3. 1935 BOHR, NIELS, F. Mem. R.S., N.L., Director, Institute for Theoretical Physics, University of Copenhagen, Blegdamsvej 17, Copenhagen, Denmark.
4. 1949 BROGLIE, LOUIS DE, D.Sc., F. Mem.R.S., N.L., Professor of Theoretical Physics, Poincare Institute, Sorbonne, Paris.
5. 1947 BURN, J. H., M.D., Hon. Sc.D. (Yale), F.R.S., Emeritus Professor of Pharmacology, Oxford University, 2 Capel Close, Oxford.
6. 1955 CHAIN, E. B., F.R.S., N.L., Professor of Biochemistry, Instituto Superiore de Sanita, 299 Viale Regina Elena, Rome, Italy.
7. 1954 CHAPMAN, SYDNEY, F.R.S., High Altitude Observatory, Boulder, Colorado, U.S.A.
8. 1940 CHRISTOPHERS, SIR SAMUEL RICKARD, Kt., C.I.E., O.B.E., M.B., C.H.B., F.R.S., Brevet-Colonel, I.M.S. (R), 186 Huntingdon Road, Cambridge.
9. 1957 COMPTON, A. H., M.A., Ph.D., Sc.D., LL.D., N.L., Washington University, St. Louis 5, Missouri, U.S.A.
10. 1944 DALE, SIR HENRY HALLETT, O.M., G.B.E., M.A., M.D., F.R.C.P., Hon. D.Sc., Hon. M.D., Hon. LL.D., F.R.S., N.L., Chairman, of the Wellcome Trust ; 54 Campden Hill Court, Kensington, London, W. 8.

| Serial No. | Year of election | |
|------------|------------------|---|
| 11. | 1950 | DEBYE, P.J.W., F.Mem.R.S., N.L., Professor Emeritus of Chemistry, Cornell University, Ithaca, New York, U.S.A. |
| 12. | 1947 | DIRAC, P.A.M., F.R.S., N.L., Lucasian Professor of Mathematics, Cambridge University, Cambridge. |
| 13. | 1954 | ENGELHARDT, V. A., Professor of Biochemistry. Institute of Biochemistry, Moscow Academy of Sciences, Moscow, U.S.S.R. |
| 14. | 1949 | EULER, HANS VON, N.L., Professor of Chemistry, Stockholm University, Box 6073, Stockholm, Sweden. |
| 15. | 1939 | FISHER, SIR RONALD A., Sc.D., F.R.S., Gonville and Caius College, Cambridge. |
| 16. | 1953 | HALDANE, J.B.S., (Hon.) D.Sc., F.R.S., Research Professor, Indian Statistical Institute, 203 Barrackpore Trunk Road, Calcutta 35. |
| 17. | 1954 | HEISENBERG, W., F.Mem.R.S., N.L., Director, Max-Planck Institut fur Physik und Astrophysik, Aumeisterstrasse, Munchen 23, West Germany. |
| 18. | 1944 | HILL, A. V., C.H., O.B.E., Sc.D., F.R.S., N.L., Hon. Research Associate, Department of Physiology, University College, Gower Street, London, W.C. 1. |
| 19. | 1952 | HOUSSAY, BERNARDO A., F. Mem. R.S., N.L., Institute de Biologia y Medicina Experimental, Costa Rica 4185, Buones Aires, Argentina. |
| 20. | 1956 | KAPITZA, PETER, Ph.D., F.R.S., Director, Institute for Physical Problems, Academy of Sciences, Moscow U.S.S.R. |
| 21. | 1954 | KARRER, PAUL, F. Mem. R.S. N.L., Spyrsteig 30, Zurich, Switzerland. |
| 22. | 1958 | KIHARA, HITOSHI, Director, National Institute of Genetics, Yata 1111, Misima, Sizuoka-Ken, Japan. |
| 23. | 1956 | KREBS, SIR HANS A., F.R.S.. N.L., Department of Biochemistry, University of Oxford, South Parks Road, Oxford, England. |
| 24. | 1951 | KUHN, RICHARD, N. L., Professor Dr., Director, Max-Planck Institut fur Medizinische Forschung, Institut fur Chemie, Heidelberg, Germany. |
| 25. | 1950 | LAUE, M. VON, N. L., Direktor des Fritz-Haber-Institutes der Max-Planck Gesellschaft, Berlin-Dahlem, Faradayweg 8; Honorar-Professor der Universitat, Gottingen, Germany. |

Serial No. Year of election

26. 1955 LEIPER, R. T., F.R.S., Emeritus Professor of Helminthology, University of London, London.
27. 1952 MARK, HERMANN, Director of Polymer Research, Brooklyn Polytechnic Institute, Brooklyn, U.S.A.
28. 1935 MARSHALL, SIR GUY A. K., K.C.M.G., D.Sc., F.R.S., 31 Melton Court, London, S.W. 7.
29. 1951 MULLER, H. J., D.Sc., F. Mem. R.S., N.L., Distinguished Service Professor, Department of Zoology, Indiana University, Bloomington, Indiana, U.S.A.
30. 1956 NESMEYANOV, A. N., President of the Academy of Sciences, U.S.S.R., Moscow.
31. 1957 PAULING, LINUS, Sc.D., Ph.D., F. Mem. R.S., N.L., Professor of Chemistry, California Institute of Technology, Pasadena, California, U.S.A.
32. 1937 ROBINSON, SIR ROBERT, O. M., D.Sc., F.R.S., N.L., 170 Piccadilly, London, W. 1.
33. 1938 RUSSELL, SIR E. JOHN, D.Sc., F.R.S., Compsfield Wood, Woodstock, Oxfordshire, England.
34. 1950 SCHRÖDINGER, ERWIN, F. Mem. R.S., N.L., Professor of Theoretical Physics, University of Vienna, Wien 9, Pasteurgasse 4, Austria.
35. 1946 SELYE, HANS, Professor and Director, Institute of Experimental Medicine and Surgery, University of Montreal, Canada.
36. 1949 SHAPLEY, HARLOW, M.A., LL.D., D.Sc., D. Litt., Peterborough, New Hampshire, U.S.A.
37. 1950 SIEGBAHN, K. M. G., F. Mem. R.S., N.L., Nobel Institute of Physics, Stockholm, Sweden.
38. 1947 SZENT-GYÖRGYI, A., N.L., Professor of Biochemistry, Marine Biological Laboratory, Woods Hole, Mass., U.S.A.
39. 1947 UREY, HAROLD C. F. Mem. R.S., Professor of Chemistry, University of California at La Jolla, California, U.S.A.
40. 1951 WAKSMAN, SELMAN A., Director of the Institute of Microbiology, Rutgers, The State University, New Brunswick, N.J., U.S.A.
41. 1957 YOSHIDA, TOMIZO, Dept. of Pathology, Faculty of Medicine, University of Tokyo, Hongo, Tokyo, Japan.
42. 1957 YUKAWA, HIDEKI, D.Sc., N.L., Research Institute for Fundamental Physics, Kyoto University, Kyoto, Japan.

APPENDIX II

COMMITTEES

Sectional Committees, 1959

To serve until
Dec. 31

(1) 'Mathematics' Committee for Mathematics, Astronomy and Geodesy :—

| | | |
|--|-----|------|
| Prof. S. Gupta | ... | 1959 |
| Prof. P. L. Srivastava | ... | 1959 |
| Prof. R. P. Bambah | ... | 1960 |
| Dr. C. R. Rao | ... | 1960 |
| Prof. B. N. Prasad | ... | 1961 |
| Prof. N. R. Sen (Secretary & Convener) | ... | 1961 |

(2) 'Physics' Committee for Physics and Meteorology :—

| | | |
|---|-----|------|
| Prof. P. S. Gill (Secretary & Convener) | ... | 1959 |
| Prof. R. S. Krishnan | ... | 1959 |
| Dr. K. R. Dixit | ... | 1960 |
| Prof. N. R. Tawde | ... | 1960 |
| Prof. D. S. Kothari | ... | 1961 |
| Prof. S. N. Bose | ... | 1961 |

(3) 'Chemistry' Committee for Pure and Applied Chemistry :—

| | | |
|-------------------------------------|-----|------|
| Prof. R. P. Mitra | ... | 1959 |
| Dr. Atma Ram (Secretary & Convener) | ... | 1959 |
| Dr. U. P. Basu | ... | 1960 |
| Prof. B. Sanjiva Rao | ... | 1960 |
| Prof. S. Ghosh | ... | 1961 |
| Dr. R. C. Shah | ... | 1961 |

(4) 'Engineering Sciences' Committee for Engineering, Metallurgy, Electrotechnics and kindred subjects :—

| | | |
|--|-----|------|
| Dr. D. R. Malhotra | ... | 1959 |
| Sri N. V. Modak | ... | 1959 |
| Sri V. Cadambe | ... | 1960 |
| Prof. M. S. Thacker (Secretary & Convener) | ... | 1960 |
| Prof. C. S. Ghosh | ... | 1961 |
| Prof. M. Sengupta | ... | 1961 |

(5) 'Geology' Committee for Geology, Palaeontology, Mineralogy and Geography :—

| | | |
|--|-----|------|
| Dr. P. K. Ghosh | ... | 1959 |
| Sri V. P. Sondhi | ... | 1959 |
| Dr. M. S. Krishnan | ... | 1960 |
| Dr. W. D. West | ... | 1960 |
| Prof. S. Deb | ... | 1961 |
| Dr. D. N. Wadia (Secretary & Convener) | ... | 1961 |

(6) 'Botany' Committee for Pure and Applied Botany, Forestry and Agronomy :—

| | | |
|--------------------------------------|-----|------|
| Prof. P. N. Bhaduri | ... | 1959 |
| Prof. R. Misra | ... | 1959 |
| Dr. B. P. Pal (Secretary & Convener) | ... | 1960 |
| Prof. T. S. Sadasivan | ... | 1960 |
| Prof. P. Parija | ... | 1961 |
| Dr. H. Santapau | ... | 1961 |

(7) 'Zoology' Committee for Pure and Applied Zoology and Anthropology including Ethnology :—

| | | |
|--|-----|------|
| Prof. J. L. Bhaduri | ... | 1959 |
| Dr. H. R. Mehra (Secretary & Convener) | ... | 1959 |
| Prof. K. P. Chattopadhyay | ... | 1960 |
| Prof. M. A. Moghe | ... | 1960 |
| Dr. E. S. Narayanan | ... | 1961 |
| Dr. H. N. Ray | ... | 1961 |

(8) 'Physiology' Committee for Animal Physiology, Pathology, Bacteriology, Psychology and other Medical and Veterinary subject :—

| | | |
|---|-----|------|
| Dr. V. R. Khanolkar | ... | 1959 |
| Dr. K. Mitra | ... | 1959 |
| Dr. J. C. Ray | ... | 1959 |
| Dr. K. N. Bagchi (Secretary & Convener) | ... | 1960 |
| Dr. B. B. Dikshit | ... | 1960 |
| Dr. M. V. Govindaswamy | ... | 1960 |
| Dr. S. Banerjee | ... | 1961 |
| Dr. V. S. Mangalik | ... | 1961 |
| Lt -Col. S. Datta | ... | 1961 |

Finance Committee, 1959

The President
 The Treasurer
 The Two Secretaries
 The Editor of Publications
 Prof. P. S. Gill
 Prof. D. S. Kothari

Research Fellowships Committee, 1959

| | | |
|-----------------------|---|-------------------|
| The President | { | <i>Ex-officio</i> |
| The Treasurer | | |
| The Two Secretaries | | |
| Dr. C. R. Rao | { | Mathematics |
| Dr. B. S. Madhava Rao | | |
| Prof. B. N. Prasad | | |
| Dr. K. R. Dixit | { | Physics |
| Prof. H. Rakshit | | |
| Prof. N. R. Tawde | | |

ANNUAL REPORT

| | | |
|-----------------------|---|----------------------|
| Prof. R. P. Mitra | { | Chemistry |
| Dr. K. P. Basu | | |
| Prof. S. M. Mehta | | |
| Dr. W. D. West | { | Geology |
| Prof. S. Kilpady | | |
| Dr. B. C. Roy | | |
| Prof. I. Banerji | { | Botany |
| Dr. B. P. Pal | | |
| Prof. R. Misra | | |
| Dr. N. K. Panikkar | { | Zoology |
| Sri Nirmal K. Bose | | |
| Prof. B. R. Seshachar | | |
| Dr. A. C. Ukil | { | Physiology |
| Dr. B. Mukerji | | |
| Dr. B. B. Dikshit | | |
| Prof. C. S. Ghosh | { | Engineering Sciences |
| Sri V. Cadambe | | |
| Dr. V. M. Ghatage | | |

Grants Committee, 1959

The President
 The Treasurer
 The Two Secretaries
 Conveners of all Sectional Committees.

Standing Committee for Organization of Symposia, 1959

| | | |
|----------------------------------|---|-------------------|
| The President | { | <i>ex-officio</i> |
| The Treasurer | | |
| The Two Secretaries | | |
| Dr. U. P. Basu | | |
| Prof. C. S. Ghosh | | |
| Prof. P. S. Gill | | |
| Prof. B. C. Guha | | |
| Dr. M. S. Krishnan | | |
| Dr. B. Mukerji | | |
| Prof. T. S. Sadasivan | | |
| Prof. B. R. Seshachar (Convener) | | |

Building Committee, 1959

The President
 The Treasurer
 The Two Secretaries
 Members of Council resident in Delhi - with powers to co-opt other members.

Library Committee, 1959

The President
 The Treasurer
 The Two Secretaries
 Members of Council resident in Delhi.

Biological Board.

Members of Sectional Committees for Botany, Zoology & Physiology,
 Members of Council who are biologists including Physiologists,
 with powers to co-opt other members.

Board for Physical Sciences

Members of Council and Sectional Committees belonging to Mathematics,
 Physics, Chemistry, Engineering Sciences and Geology, with powers to co-opt
 other members.

History of Science Board

Dr. A. C. Ukil (Convener)

Prof. G. P. Majumdar

Prof. A. S. Altekar

Prof. D. D. Kosambi

Sri S. N. Sen

Sri A. Rahman

Major-Gen. S. L. Bhatia

}

co-opted

Publication Advisory Board, 1959

The President

The Treasurer

The Two Secretaries

The Editor of Publications

Members of Council resident in Delhi—with powers to co-opt other members

APPENDIX III

IMPORTANT RESOLUTIONS OF THE COUNCIL

Most of the important items from the proceedings have already been abstracted and incorporated in the Report. Such other important decisions as could not be included in the body of the Report are given below under provisions of the Rule 43(f).

June 26, 1958.

Re: RESEARCH FELLOWSHIPS

The chairman informed that the Research Fellowships Committee on June 25th, 1958 expressed the view that in recommending awards normally only candidates with Doctor's degrees should be chosen and if any one was to be recommended without such degree his case needed special scrutiny and justification. The Council accepted the view.

January 20, 1959.

Re : PREPARATION OF THE HISTORY OF SCIENCE IN INDIA

The Council adopted the following recommendation of the History of Science Board :-

"Plan of work for the remaining period of the Second Plan :

It was decided to cover the period from ancient times to 1200 A.D.

The following division of subjects was approved :

| <i>Main-group</i> | <i>Sub-group</i> |
|--|--|
| A. Mathematics, Astronomy, Earth Science | Astronomy, Meteorology, Geography, Cartography, Geology & Mineralogy. |
| B. Physics, Engineering, Technology. | Physics, Civil Engineering (including Military technology), Architecture. |
| C. Chemistry and Applied Chemistry. | Alchemy, Industrial and Fermentation Chemistry, Ceramics, Mining and Metallurgy. |
| D. Biology, Agriculture, Medicine, Anthropology. | Botany, Zoology, Anthropology, Agriculture and Animal Husbandry. |
| E. Health, Medicine, Pharmaceutics. | |

To get at source materials.

It was suggested that exhaustive bibliography of available literature (manuscripts, books, copper plates and archaeological remains) available in various libraries in India and Nepal, with date of compilation or publication, be prepared.

A social and religious background of the times and the impact (application) of contemporary discoveries on society have also to be noted.

It was recommended that a Unit consisting of the following staff be attached to a learned body or University suitable for the work :

| | | | | | |
|-----|---|------------|-----|--------|------|
| (1) | One distinguished scientist who will guide and supervise the Unit's work and under whom will be the following scholars :— | Honorarium | Rs. | 3,000 | p.a. |
| | One with training in Indology and two versed in Sanskrit and/or Pali each at Rs. 200/- per month or Rs. 2,400 p.a. | ... | Rs. | 7,200 | p.a. |
| (2) | Travelling allowances | ... | Rs. | 1,200 | p.a. |
| (3) | Clerical & typing charges | ... | Rs. | 2,000 | p.a. |
| (4) | Contingencies | ... | Rs. | 2,000 | p.a. |
| | | Total | Rs. | 15,400 | p.a. |

It was recommended that two such Units be created for the present at a total cost of Rs. 30,800/- p.a. and that 2 more Units be added during the Third 5 Year Plan.

The scientist member of the unit will call for monthly reports from the scholars and will forward a consolidated report to the Board every six months.

It was decided to enlist the help of workers who have already distinguished themselves in any branch of the subjects we have in view."

APPENDIX IV
SUMMARIES OF FINAL REPORTS OF RESEARCH FELLOWS.

NIS Senior Research Fellowship.

| | | |
|-------------------------|-----|--|
| Name of Research Fellow | ... | Dr. A. Guha |
| Subject of Research | ... | Investigation into the Structural and functional morphology of <i>E. coli</i> —and their interaction with host bacteria. |

Institute of Nuclear Physics, Calcutta.

(1.4.57—31.3.59)

Bacteriophages were isolated along with their host cells from stools of patients suffering from dysentery. A new type of host-phage system, *E. coli communior*-phage, was obtained. The titre of phage particles were increased by using M & E medium and by ultracentrifugation.

Rate of phage adsorption to host cells were studied in media having different constituents, various viscosities and different pH values. In M & E medium 92% of the phage particles were adsorbed in 10 minutes. The adsorption kinetics ($\ln U_0/U$ cc/min) was liner in different viscous media and the adsorption peak was due to a contest between the nett ionic configuration and the natural diffusion force.

The heat inactivation curves of various concentrations of dry and wet samples of bacteriophage showed that in the wet phage samples various dilutions, the curve became exponential after certain degree of temperature. These starting temperatures were different for different dilutions. In the dry phage samples the inactivation process was regular and exponential. Similarly, the rate constant obeyed the first order kinetics in the dry phage samples but not in the wet phage samples.

In the head of the phage particle, certain organized thread-like structure which was not affected by acid treatment was observed. This structure, in fact, is the chromosome of the phage particle.

The shadow of the tail of phage particles showed periodicity in the electron micrographs due to distribution of alternate dark and transparent zones along its length. The attachment of the bacteriophages to the host cell was described *random*, i.e., they were found to be attached to the host cell by any part of their body. During the multiplication of the bacteriophage particles within the host cell, the bacterial cell matter becomes alveolated after phage invasion and within each alveolus a dense thread-like structure was deposited. When the structure was fully formed, the alveolus with the fully developed granule was detached from the host cell matter as a free phage particle.

A thin film of bacteriophage suspension on 5% gelatin deposited on a cover glass was irradiated with ^{210}Po giving a dose (D) of 3×10^{10} particles/cm²/min. The survival fraction (n/n_0) were plotted versus dose and this curve was found linear. From the curve, the target diameter was calculated from the relation $n/n_0 = e^{-\frac{D}{k}}$ as 200 Å.

The lysogenic strain of *E. coli communior* cells when irradiated with UV rays produced virulent phages spontaneously. The yield of these phage particles was found maximum at the dose of 2010 ergs/sec/mm².

Phage resistant cultures were obtained from the survival bacterial colony in a heavily infected bacterial culture by phage particles. Bacteriophage of different plaque characters were isolated from a mixed suspension by picking up individual plaque developed out of each mutated phage particles. When the two plaque characters were crossed in differet proportions, it was found that recombination frequency was independant of various proportions in which the two plaques types were crossed.

Name of Research Fellow

... Dr. S. Narayanaswami

Subject of Research

... Experimental studies in the culture of plant embryos in vitro.

Delhi University

(18. 7. 56—17. 7. 58)

Experimental studies on growth of excised embryos in culture were undertaken. The grass embryo, unlike the dicot or other monocot embryo is exemplified by the possession of at least four main regions viz., the scutellum, coleoptile, coleorhiza and the mesocotyl for experimentation of different kinds. In young embryos the several organs represent a co-ordinated unit of potential meristems. Although valuable knowledge has accumulated in the field of embryo culture within the last decade, there is paucity of more specific data on the influence of various growth substances on embryogenesis. This investigation deals with the physiomorphological and anatomical responses of excised embryos to diverse growth substances *in vitro* in order to explore the nutritional factors necessary for maximal growth in particular organs of the embryo and the factors which will increase the vigour and ultimate size of immature embryos with a view to eventually throwing some light on the probable factors controlling organ differentiation.

SYNOPSIS OF EXPERIMENTAL RESULTS

1. Overgrowth of scutellum of *Pennisetum* embryos.

In both liquid and agar media (White's modified solution, White, 1943) containing the purine derivative, adenine in concentrations of 1, 10, 20, 40 and 60 mg/l, scutelli of embryos grew into abnormal size and shape, compared to the control in which growth was normal, whereas the embryonal axis was inhibited. Application of even as low as 1 mg/l of adenine caused the scutellar tumor, the upper limit being 60 mg/l. The growth of scutellum was accentuated by external application of IAA. Deep indentations of the epithelial layer resulted in the formation of lobullate scutelli. In similar treatments of embryos of barley, oat and wheat, only normal seedling growth was obtained.

2. Influence of guanine in inducing embryonal tumor

Callusing of entire scutellum of *Pennisetum* embryos was observed in media to which guanine 40 mg/l was added. As with adenine external application of IAA stimulated the scutellar tissue to grow into blazarre forms. Growth was sustained on transfer of such embryos to fresh media containing the growth chemical. Histological peculiarities have been recorded. Evidences have been adduced to indicate that adenine and guanine are factors for scutellar growth, the homology of the scutellum being that of a leaf, but specific for only *Pennisetum* embryos.

3. Use of coconut milk as an adjuvant in embryo culture

Embryos were cultured on the basal medium containing coconut milk (20—40 per cent)+IAA, 2 mg/l. The scutellum became swollen mostly by cell enlargement and rarely by cell division also. Embryos grown on liquid adenine and bearing callused scutelli were transferred to fresh medium containing coconut milk, adenine +IAA. Inhibition of embryonal growth but enhanced growth of scutellum was observed. This would indicate the possibility of obtaining a continuous growth of scutellar tissue of a grass.

4. Rooting of scutellum in sterile culture.

Root-like processes from scutellar tissue were formed in embryos cultured on liquid media to which 2,4-D+IAA were added but not in treatments with either 2,4-D or IAA alone. Rooting was also observed in prolonged cultures of tumoroid tissue of scutellum of *Pennisetum*. Stimulus to endogenous root formation from the perivascular strand of scutellum was also observed in cultures on tomato juice and coconut milk etc. Profuse rooting from scutellum of maize in culture containing 2,4-D was secured. Endogenous root primordia were initiated in abundance from scutellum in cultures of entire caryopsis of *Echinochloa*. Such rooting were akin to that observed when leaves of certain genera are kept in damp chambers or in peat.

5. Growth of embryos in in vitro culture of 'entire' caryopsis

Fertilised ovaries of *Pennisetum* in which the embryos were young and differentiating were cultured in several media containing kinetin, adenine etc. The scutellum was activated to grow as an irregular tumoroid mass followed by degeneration of the embryonal axis. Rooting from the scutellar base was observed. With *Hordeum*, the embryos grew to double the normal size while no growth was obtained in the case of wheat. The endosperm more of ten degenerated than remaining healthy. However, growth of the fruit to natural size was never reached. A peculiar feature not reported in experimental embryology was what appeared to be a congenital fusion and development of the embryonal axis with the scutellum over its entire length. Formation of supernumerary buds enclosed within separate coleoptiles originating from the mesocotyl region was also observed.

6. Ontogenetic patterns of embryo growth in culture.

A correlation between age and morphological stage of embryo on excision and concentration of the growth chemical in determining the developmental pattern of the embryo has been witnessed. The younger the embryo is at culture, the more abnormal is its growth behaviour. Thus fasciated embryos result. The pattern of embryo growth in media involving the use of several synthetic hormones and other chemicals are being studied.

7. Effect of MH on embryo growth in vitro

The inhibitory effect of MH even at extremely low levels is indicated although a temporary stimulation of coleoptilar growth was observed. Overwhelming evidence has been adduced to show that MH primarily affects the root meristem than the shoot meristem. The manifold effects of MH on embryos have been recorded: like, the severance of coleoptile from coleorhiza by the formation of a separation layer through the mesocotyl region; elongation of scutellar cells; necrosis of sieve cells of the precam-

bial strand of scutellum; precocious maturation of vascular elements into scalariform tracheids; suppression of cell division etc., but no mitotic irregularities attributed to the substance was observed.

8. Effects of mutilation on embryo growth

Surgical treatments have indicated certain features worthy of report. Immature scutelli grew to maximum size mostly by cell enlargement. Proliferation of cells around the procambial strand was observed. New root primordia are stimulated from the cut end of scutellum but regeneration of adventitious buds never occurred. Seminal roots grew out if the primary root was excised.

The whole investigation is of intrinsic value to the particular problem of plant abnormalities. The most significant and provocative result has been the pronounced effect of diverse growth substances on scutellar growth of the various grass embryos.

Name of Research Fellow

... Dr. G. Suryanarayanan

Subject of Research

...

Investigations into the computing problems of X-ray crystallography and electronic aids for the same.

Indian Institute of Science, Bangalore

(1. 10. 56—30. 9. 58)

X-ray crystallographic analysis calculations are of several kinds all involving multiple Fourier Series. The modern methods involve vector-shift calculations utilising the Patterson and similar functions. A computing system has been designed to undertake quick calculation of not only direct Fourier projection but also to make vector-shift calculations for $h, k = \pm 25$, operating on the $\cos(hx \pm ky)$ principle. The system utilizes the principles of synchronous magnetic recorder along with the Doppler effect for frequency shifting. Provision has been made to enable the function to be evaluated at two points simultaneously so that product and minimum functions can be evaluated. A number of innovations and useful features have been in-corporated particularly the proposal for boundary displacement type of magnetic recording which has good linearity of recording. The report gives detailed description, illustrated with drawings and photographs.

NIS JUNIOR RESEARCH FELLOWSHIP

Name of Research Fellow

... Dr. (Miss) Sulaxana Kumari

Subject of Research

...

Summability in infinite series.

Allahabad University

(23. 7. 56—22.7.58)

Work on the following topics has been done :—

- (i) *Absolute summability of the Fourier series of the class of functions satisfying Lipschitz's condition.*

Here the Absolute summability of the Fourier series of a function of the class L^p and of the class $\text{Lip } (a, p)$, for $1 < p \leq 2$, $a \geq 0$, both for negative and positive orders,

has been studied. Sufficient conditions for the almost everywhere absolute summability with positive orders, and absolute summability *at a point* with negative orders, have been obtained.

A suitable non-local condition, which is heavier than the function belonging to the class L^p , has been obtained which yields summability $IC, 1/pI$ of the Fourier series at a point, it being known that the summability $IC, 1/p + \alpha I$ for $1 < p \leq 2$, for the Fourier series of the class L^p , at a point, depends on non-local properties for $\alpha > 0$ and on non-local properties for $\alpha = 0$.

(ii) *Non-convergence of Fourier series.*

See the paper published in the Proc. American Math. Soc. 9 (1958), 293—299.

Four theorems have been obtained in this paper showing, by means of negative examples, that two convergence criteria for Fourier series obtained by Wang (Proc. London Math. Soc., 47, 1942, 308—325), are best possible of their kind, one of the theorems being a generalization of a recently published result of Hsiang [Proc. Amer. Math. Soc. 7 (1956), 1036—1039].

(iii) *Behaviour of the Fourier coefficients.*

Here some results dealing with the behaviour of the Cesaro means, with negative orders, of Fourier series, its conjugate series and some other associated sequences, when the Fourier coefficients and the generating function satisfy certain order conditions, have been obtained.

(iv) *Determination of the Jump of a function.*

In this paper theorems on the determination of the jump of a function by considering the summability of the conjugate series of its Fourier series, applying Logarithmic means, and the determination of the jump of its generalized derivative, by considering the Logarithmic summability of the successively derived series of the conjugate series of its Fourier series, have been proved.

(v) *Strong Cesaro summability of Fourier series —*

Result of the following two types have been obtained.

(a) The first paper consists of theorems on the sufficient conditions for the summability $[C, k; q]$ for $k > 1, q \geq 2$, of the Fourier series, one of them being an extension of a recently published result of Chow [Journ. London Math. Soc., 33 (1958), 161—170] and the other dealing with sufficient conditions for obtaining some particular orders of the $[C, k; q]$ means of the Fourier series.

(b) Here sufficient conditions for the *almost everywhere* summability $[C, \alpha, q]$ where $0 < \alpha < 1$, for the Fourier series of a function belonging to the class $Lip(k, p)$, for $1 < p < 2, k > 0, kp < 1$, have been obtained.

(vi) *Absolute summability of Fourier expansions.*

Results have been obtained proving that the absolute Cesaro summability of order k , for $1 > k > 0$, of the Fourier sine expansion does not necessarily imply the summability IC, kI of the Fourier cosine expansion. Sufficient conditions have also been obtained so that the summability IC, kI of the Fourier cosine expansion may be implied by summability IC, kI of the Fourier sine expansion.

(vii) *Summability of the conjugate series of a Fourier series by Riesz's exponential means.*

Sufficient conditions for the Riesz summability of certain types of the Fourier series and its conjugate series have been obtained and convergence criteria for them have been deduced.

(viii) *On the non-local property of the summability IR, log n, 1/pI of the Fourier series of the class L^p.*

It has been proved in this paper by means of an example, that the summability IR, log n, 1/pI of the Fourier series of the class L^p, $1 < p \leq 2$, is not a local property of the generating function.

Name of the Research Fellow

... Sri M. S. Ramanujan

Subject of Research

... Divergent series and Summation Methods.

Ramanujan Institute of Mathematics, Madras.

(14. 2. 57—28. 7. 58)

"The following problems were taken up for investigation.

- (1) Product theorems on summability.
- (2) The translativity problem for quasi-Hausdorff methods.
- (3) The problem of total translativity for Hausdorff methods.

Problem 1: In a paper (Math. Zeit. 65, 1956 pp. 442-447) I proved a product theorem for the Abel and quasi-Hausdorff methods with the restriction that the sequences involved are bounded. Some further investigation on this has enabled me to relax the boundedness condition to a certain extent and prove the result for a wider class of sequences which satisfy restrictions similar to those imposed by Rajagopal (Jour. Indian Math. Soc. Vol. 18, 1954, pp. 89-105) and this class of sequences include the class of bounded sequences as a sub-class. I have also given alternative proofs of my earlier theorems in the paper cited above, which has enabled me to prove

Theorem : If a series $\sum a_n$ belonging to the class of series with bounded partial sums is Borel summable to l then so is the transform of it by a quasi Hausdorff a_∞ -matrix.

Also a theorem on the product of the Abel and (S* 'μ) methods defined by me (see Quart. J. Math. 8, 1957, pp. 197-213) has now been proved by me and this gives as a special case a result indicated by Szasz without proof, on the product of Abel and Sa method.

Problem 2.: For the class of series with bounded partial sums I have solved the above problem and the general result in this is the following theorem :

Theorem : Let $(H^* \mu_n)$ and $(H^* \frac{\mu_{n+1}}{\mu_n})$ be both a_∞ -matrices. Then for the class β of series with bounded partial sums, the method is translatable to the left ; if in addition the limit constant associated with $(\frac{\mu_{n+1}}{\mu_n})$ is not $\frac{1}{2}$, then the method is translatable, again for the class β ,

As corollaries to this result we have the results on the translativity of the method of Taylor series continuation. The method of proof of the above result has suggested relaxations on the condition of boundedness of the sequence of partial sums and this will be of interest in the investigation of the same property for unrestricted sequences.

The above results are contained in the paper THE PROBLEM OF TRANSLATIVITY OF QUASI-HAUSDORFF METHODS, Proc. Nat. Inst. Sc. India Section A, 1957, pp.4-14.

Problem 3: Among the 3 well-known methods (viz) Cesaro, Euler and Holder it is known that only the Cesaro methods are totally translative (i.e.) translative even when the limits involved are infinite, whereas the Holder and Euler methods are totally translative either to the right or left only, but not to both sides. This suggests the investigation of the problem of Total Translativity of Hausdorff methods. (This problem has been detailed out in the programme submitted by me). I have now been able to prove that a conservative Hausdroff method satisfying conditions A of Kuttner [Proc. London Math. Soc. (3),6(1956)] will be totally translativity if and only if it is the Cesaro method or a scalar multiple of it.

| | |
|-------------------------|---|
| Name of Research Fellow | ... Sri B. B. G. Sarma |
| Subject of Research | ... Study on some aspects of sedimentary petrography. |

Andhra University, Waltair.

(1. 4. 57—1. 7. 58)

AIM OF THE WORK

The study of the clay mineral extracts from the sedimentary clays, shales and shaly sandstones from Chintalapudi (Kampti), Gollapalli (Rajmahal) and Rajahmundry (Cuddalore) formations of parts of Andhra Pradesh, is the problem taken up.

METHOD OF STUDY AND RESULT

(i) *Field Study :*

An area of 150 sq. miles in Krishna district was previously mapped by the present worker. The three sedimentary formations mentioned earlier constitute the major rock units. Some more samples have been collected from equivalent formations in the Guntur, west and east Godavari districts,

(ii) *Preparation of the clay mineral extract :*

The method followed is the same for all the laboratory studies. Separation of the fraction less than 2 microns in size from each sample is the result to be achieved. For this purpose, coarser fractions in each sample were eliminated by sieving. A fraction of 60 microns was obtained by wet sieving with a phosphour-bronze mesh. This is further separated into a coarser than 2 micron fraction and a finer than 2 micron fraction by settling according to Stoke's Law. The fraction finer than 2 microns in size is taken and used for laboratory studies.

(iii) *Differential Thermal Analysis :*

Forty samples were analysed thermally. A portable unit, consisting of a differential thermocouple, made of Chromel-Alumel with a pyrometer connection, a sensitive galvanometer, a pyrometer and a furnace with a rheostat was used for the analysis. The clay minerals were studied against calcined alumina, a thermally inert material. Exothermic and endothermic reactions at every 20° C rise in temperature were noted and plotted.

Samples from the Chintalapudi formation show an initial endothermic reaction (a few do not) another at about 600° C and an abrupt exothermic reaction at about 980° C. Comparing these with reactions of standard clay minerals, it can be inferred that these belong to the kaolinite group. The two endothermic reactions agree well with those due to water and the final exothermic one due to the formation of mullite or—alumina. It seems to be immaterial what particular member of kaolinite group is present, as these reactions take place at the level of the kaolinite layer and as the various members of the group are made up of such layers arranged differently.

Samples from the Gollapalli formation show endothermic and exothermic reactions characterising mixed layer clay minerals. X-ray analysis is necessary before anything more could be said.

The Tertiary samples show an initial endothermic reaction, another at about 600°C., and an exothermic one beyond 900° C. The positions are different from those of the first set. Comparison with standard curves indicates that a clay mineral mixture is involved with kaolinite and montmorillonite.

(iv) *Optical Studies :*

Optical examination under the ordinary petrological microscope is not possible due to the very fine size of the material. Refractive index determinations of the bulk were carried out. The indices for the Chintalapudi samples fall within the range for kaolinites; values for the other samples are not of indicative value.

Stain reactions with organic dye substances like p-aminophenol and malachite green were studied. The values are on the same lines as above, the Chintalapudi samples yielding determinative tests.

(v) *Infrared absorption studies :*

Absorption of infrared rays by the clay minerals taken as mulls in nujol is studied in the 1—15 micron range on a standard Leitz Infrared Spectrophotometer, a semi-automatic apparatus, with a manual recording device. The Chintalapudi samples show absorption peaks at 2.75 microns, 9.0 microns. and 14.5 microns.

These agree with earlier work by Keller and Pickett. Certain amount of improvement in clarification of the absorption peaks, due to fineness of the graine size being smaller than the lowest wavelength used (smaller than 2 microns), can be claimed over the earlier work. The studies are under progress.

(vi) *Geochemical Studies :*

The qualitative spectrographical study of caesium, lithium, rubidium, magnesium and potassium in fourteen samples is carried out, and the presence of the elements established. Estimation of the relative abundances of these by semi-quantitative methods is under progress.

| | |
|-------------------------|---|
| Name of Research Fellow | ... Dr. (Mrs.) P. Sinha |
| Subject of Research | ... Physics of clays with special reference to X-ray and differential thermal analysis. |

University College, of Science, Calcutta.

(1. 10. 56—30. 9. 58)

Clay fraction from sixteen soil samples have been identified and classified by x-ray and differential thermal analysis. Samples from different depths of a particular locality have also been analysed.

The effect of removal of free oxides from three soil samples has been studied.

Ten kaolin samples have been analysed by x-ray and d. t. a.

The causes of some irregularities in the basal reflection of vermiculites have been investigated.

| | |
|-------------------------|--|
| Name of Research Fellow | ... Sri H. R. Srinivasachar |
| Subject of Research | ... Cranial Osteology of Fishes—Siluroids. |

Central College, Bengaluru

(27. 6. 54—27. 6. 57)

The study of the development of skull in Siluroidea has been undertaken in order to find out whether these skeletal characters could be used in the systematics of the group. As a first stage in the studies on the cranial osteology of these fishes, the development of the chondrocranium of the members belonging to six families and also the development of the osteocranum in one of them in order to understand the sequential appearance of the various bones of the skull have been studied. During the course of the period of fellowship, seven papers have been prepared which are published in various journals including the Proceedings of the National Institute of Sciences of India. The material for the study of the chondro and osteo-cranium consists of developing fry of nine genera belonging to six families, Schilbeidae, Bagridae, Heteropneustidae, Clariidae, Ariidae and Plotosidae.

The chondrocranium of the members, *Silonia*, *Pangasius* and *Ailia* belonging to the family Schilbeidae show number of common characters and these show that the three members could be included in the same family. However, the chondrocranium of *Pangasius* resembles very much to that of *Silonia* and therefore it is suggested that the two members could be regarded as two species of the same genus *Pimelodus* as was once done by Hamilton (1822).

In Bagridae a study of the chondrocranium of *Mystus* and *Rita* discloses a number of characters which are shared by both the members. The similarities in the chondrocrania could be summarised as follows :

1. The sphenoseptal commissures are absent.
2. The solum nasi forming the floor for the nasal sacs are reduced and do not form a complete floor.
3. The foramen for the passage of the otic branch of facial nerve is absent.

4. The gap between the anterior pterygoid process and the processus-pterygoideus of quadrate is comparatively small.
5. The interhyal connecting the hyomadibulla and the ceratophyal is independent of the hyomandibula.

Further both *Mystus* and *Rita* while exhibiting these similarities also show distinctive characters in their chondrocrania, which confirm the retention of these as distinct genera under the family Bagridae (Srinivasachar, 1957 b, Morph. Jahrb.)

The development of chondrocranium has been completely described in *Heteropneustes* and is compared with that of *Clarias* (Srinivasachar, 1957 c.)

The chondrocranium of *Arius* shows a number of specialised features. But the chondrocranium of *Plotosus* appears to be the most primitive among the siluroids studied (Srinivasachar 1957 d, Morph. Jahrb.).

These studies on the chondrocrania of nine genera of the catfishes described have amply proved that the chondrocranial characters are of both classificatory and evolutionary importance.

The development of the osteocranum in *Heteropneustes* fossils (Srinivasachar 1957e) has been completely described in order to understand the correct significance of the various bones of the siluroid skull. This study has helped in solving some of the disputed points with regard to the origin of some of the bones of the skull. The early development and the external features of the developing larvae of *Heteropneustes* (Srinivasachar 1957f) has also been described.

| | | |
|-------------------------|-----|---|
| Name of Research Fellow | ... | Sri Santokh Singh |
| Subject of Research | ... | Taxonomy, zoogeography, ecology, adaptation and evolution of the insect fauna of North-West (the Panjab) Himalayas. |

Zoological Survey of India, Calcutta.

(1. 11. 56—31. 7. 58)

"INTRODUCTION :—

I worked for one year and nine months as Junior Research Fellow of the National Institute of Sciences of India. During this period, the work on High Altitude Insect Life which was already in progress before I joined as the Research Fellow, was continued and completed. The research work dealt mainly with i. faunistics, ii. taxonomic studies, iii. interpretations of field observations recorded earlier when I was a member of the three Entomological Expeditions to the N. W. Himalaya organised by Prof. Dr. M. S. Mani, iv. study of the zoogeography of the High Altitude Insects from the N. W. Himalaya and v. study and review of literature on the above mentioned topics.

LITERATURE :—

Extensive literature on the insect fauna of the N. W. Himalaya and the neighbouring areas and of high altitudes of other parts of the world was studied. No less than 400 papers dealing with varoius aspects of the high altitude insects were read and reviewed. These

include about 150 papers on Himalayan fauna, about 100 on fauna of Tibet and neighbouring regions like Pamir, Turkestan, Afghanistan, Tjakistan, China, Central Asia and Asian Russia; 75 on European alpine fauna and about 75 miscellaneous papers. More than 500 reference index cards were completed.

Annotated check-list of the insect fauna from the N. W. Himalaya was made up-to-date.

ECOLOGICAL STUDIES :—

Field notes on observations made earlier during 1954-56 were revised and interpreted. The general average of the more important environmental factors and insect communities in the biome of the montane tundra above the timber-line, i. e. beyond an elevation of 300 metres above mean sea level, various factors governing the high altitude insect life have been discussed and written up in collaboration with Dr. M. S. Mani.

TAXONOMY :—

Descriptions and sketches of high altitude Chironomidae (Diptera) viz. *Brillia kultia*, *Metriocnemus (Heterotriissocladius) kuluensis*, *Metriocnemus (Heterotriissocladius) chandra*, *Orthocladius (Pseudorthocladius) virendri*, *Trichocladius bryophila* and *Chironomus (Paraten-dipes) lahaulensis* have been finalized and sent for publication.

ZOOGEOGRAPHICAL STUDIES :—

In collaboration with Dr. M. S. Mani a paper on the zoogeography of the high altitude insects from the N. W. Himalaya was completed and sent for publication to the Linnean Society, London. In this paper the peculiarities of the high altitude insect distribution in the region are discussed. It is shown that the nival fauna of the N. W. Himalaya is characterized by the high degree of endemism, amounting to nearly 60%. The Palaeartic elements constitute 95%, of which Mediterranean elements represent only 4%. The Indo-Malayan faunal elements are represented by only 3.5%. There is a high proportion of Central-Asian and Tibetan elements in the nival insect fauna of the region.

TOURS :—

During the term of the Fellowship 3 tours were undertaken, viz. 1. to collect certain field observations for comparison in the Eastern Himalaya, ii. to study collections and literature in Forest Research Institute, Dehra Dun and iii. a short visit was paid to School of Entomology, Agra for certain laboratory and library facilities".

Name of Research Fellow

... Dr. R. Srinivasan

Subject of Research

... Photoelastic effect in crystals.

Indian Institute of Science, Bangalore.

(1. 7. 57—2. 2. 59)

The work done during this period falls under two categories : (1) work on the photo-elastic behaviour of solids and (2) theoretical work on the elastic and thermal properties of crystals.

1. PHOTOELASTIC EFFECT:

By a combination of the differential method of measurement of Bansigir and Iyengar and the spectroscopic method of Jog, the dispersion of the stress optic coefficient of the four alkali halides NaCl, KCl, KBr and KI was studied for the first time right up to 2500 Å. The following important results were obtained: (1) The stress optic coefficient ($n_3/2$) ($q_{11} - q_{12}$) decreased for all the halides as one proceeds into the ultraviolet. (3) The wavelength at which the change of sign occurs in potassium halides increases with increasing mass of the anion and (4) The change in refractivities of the ions as one passes into the ultraviolet cannot by itself explain the observed dispersion. The strain polarisability constant also varies with wavelength. The variation of the strain polarisability constant in all the alkali halides is similar and can be represented by the same type of formula.

The effect of neutron irradiation on the photoelastic behaviour of fused quartz has also been investigated. Neutron irradiation even at the small dosage employed here causes a perceptible increase in the stress of optical coefficient of fused quartz and this arises perhaps due to the intense local heating caused by the neutrons.

A modification of Mueller's method has been employed for measuring the ratio of the photoelastic constants of a number of glasses. Attempts to modify the method to measure the dispersion of these constants have not been met with success.

II. ELASTIC AND THERMAL PROPERTIES OF CRYSTALS:

Assuming an ionic model for calcium fluoride with nearest neighbour repulsive forces between calcium and fluorine and fluorine-fluorine the elastic constants of calcium fluoride were theoretically evaluated on Born's theory of crystal lattices. The results showed that (1) the repulsive interaction between the fluorine atoms is very small and (2) Born's theory can account only for a fraction of the observed value of $C_{12}-C_{44}$ in calcium fluoride and many body forces have to be invoked for explaining the observed value of $C_{12}-C_{44}$. Using the expressions for the coupling co-efficients derived in this work the lattice frequencies were calculated for 8 points in the reciprocal lattice. The thermal expansion and specific heat of calcium fluoride were satisfactorily accounted for on this model.

Work is being carried out on the vibration spectrum of the zinc sulphide lattice to find the effect of a small long range force superposed on the short range forces on the specific heat and dispersion relations of zinc blende. Assuming a purely short range interaction the vibration spectrum of zinc blende has been obtained using Houston's method. Calculations are being made assuming a long range Coulomb interaction superposed on the short range forces.

ICI (INDIA) RESEARCH FELLOWSHIP

| | | |
|-------------------------|-----|---|
| Name of Research Fellow | ... | Mrs. M. Datta |
| Subject of Research | ... | Cytological and experimental studies on the dividing figures of free nuclei suspended in the endospermal milk of some palmae. |

Bose Institute Calcutta

(10. 9. 56—9. 9. 58)

Nuclei suspended in the endospermal milk of coconut and areca were reported to undergo mitosis, unsupported by cytoplasm or cell wall. Later with certain precautions, it was possible to induce these nuclei to divide while on the slide, and also while being watched through the microscope. In this way the entire division process was reported and many details were noted for the first time. Coconut endosperm has proved a highly advantageous material for such *in vivo* studies and being of watery consistency, the cytologists' chief stumbling block, a suitable mounting medium, is removed. Recently attention has been turned more to the process of the actual division itself, rather than to its variations and a thorough knowledge of the factors that regulate this vital process is the need of the hour. So far, no material as favourable as coconut is proving to be, has appeared in literature. Adequate arrangements have been made for a regular supply of fresh material. At present the preparations continue with division for a maximum period of 4 hours at a time. In order to prolong this period, a sterilized temperature controlled chamber has been built and is undergoing the final stages of construction. It is expected that in this room culture flasks may be maintained in the meristematic state for a period of at least 24 hours if not several days.

Several apparatus have been employed to understand the living process more fully; these include phase contrast, dark field studies and the use of the micromanipulator; this rare and expensive tool is in use now and is expected to help in understanding some of the properties of among others, the nuclear membrane, the spindle apparatus, polar bodies, the mitochondria and finally, if possible, an isolated living chromosome. There are arrangements and excellent photomicrographs have been taken, of all points that have been noted and have helped to furnish proof to show the reality of spindle fibres and also how spindle shape may be affected by experimental factors. The resilience and power of recovery of the spindle apparatus have been shown and also that it is a distinct phase from the part of nucleoplasm which is continuous. The action of coumarin on mitosis has actually been watched and its mode of action noted for the first time. It has been noted that the reaction though drastic, is not lethal. Finally the reaction of the spindle gives rise to certain revealing questions as to its properties and it is demonstrated that it is apparently elastic. Facts noted in coconut endosperm are confirmed in the nuclei of *Areca* & *Borassus* endosperm, and these two among others in the Palmae family offer ample scope for further insight into a life process.

| | | |
|-------------------------|-----|------------------|
| Name of Research Fellow | ... | Sri K. Subba Rao |
| Subject of Research | ... | Ultrasonics |

Andhra University Waltair

(23. 3. 57—30. 6. 58)

The variation of ultrasonic velocity, adiabatic compressibility and apparent molal compressibility with molal concentration has been studied in the case of aqueous solutions of seven coloured salts 1). Potassium chromate, 2). Cupric chloride, 3). Nickel nitrate, 4). Copper sulphate, 5). Ferrous sulphate, 6). Potassium ferricyanide and 7). Potassium ferrocyanide. It is observed that the ultrasonic velocity increases linearly with molal

concentration for all the coloured salts solutions. It is also observed that the adiabatic compressibility decreases more or less linearly with increasing concentration and is in agreement with the relation derived from Debye-Huckel's theory.

The investigation of ultrasonic velocity, adiabatic compressibility and molar sound velocity in solutions of benzoic acid in chloroform, benzene and ethyl alcohol, phthalic acid in methyl alcohol, ethyl alcohol, and acetone and salicylic acid in methyl alcohol was made. In all the seven cases of solutions a progressive increase of ultrasonic velocity and decrease of compressibility was observed with concentration. An interesting case in that of benzoic acid—chloroform solution where we observed a decrease of density with increase of concentration. In spite of this decrease in density the compressibility showed only a decrease with increase of concentration. The variation of molar sound velocity with molar fraction is found to be strictly linearly increasing in all these seven cases. It is shown that, it is possible to obtain the value of molar sound velocity for the pure solute by extrapolating the values up to a molar fraction of 100%.

A simple rapid and accurate method of determining temperature coefficient of ultrasonic velocity in liquids is developed, and the following nine liquids are studied. 1). Nitrobenzene, 2). Methyl acetate, 3). ethyl acetate, 4). Butyl acetate, 5). ethylene glycol, 6). ethylene glycol monomethyl ether, 7). ethylene glycol monoethyl ether, 8). Diethylene glycol and 9). Diethylene glycol monoethyl ether. It is found that in all the cases the ultrasonic velocity is linearly decreasing with increasing temperature. For the cases of (1), (2) and (3) the values for the temperature coefficients are agreeing very well with the previously reported values and the values for the remaining liquids have been obtained for the first time.

The following five binary liquid mixtures have been investigated from the point of view of the variation of density, ultrasonic velocity, adiabatic compressibility and molar sound velocity with molar concentration.

| | | | | |
|-------------------------|-----|-----|-----|----------|
| 1. Methyl alcohol | ... | ... | ... | acetone. |
| 2. " " | ... | ... | ... | benzene. |
| 3. " " | ... | ... | ... | toluene. |
| 4. Carbon tetrachloride | ... | ... | ... | acetone. |
| 5. Carbon disulphide. | ... | ... | ... | acetone. |

In all the cases studied, however velocity and adiabatic compressibility varies, it is found that there is a perfect linear variation of molar sound velocity with concentration.

The variation of ultrasonic velocity with concentration in the colloidal solutions of sodium oleate and potassium oleate is determined by the phase with pulse method. The absorption co-efficients have also been measured for the sodium oleate solutions by the standard pulse method using attenuator. It is found that the variation of absorption coefficient expressed in db/cm with concentration is nearly linear.

APPENDIX V

INTERNATIONAL UNIONS AND CONFERENCES

A list of international scientific and technical conferences which were held in South and South East Asia during the year 1958-59 is given below :

WHO Commission for Synoptic Meteorology, New Delhi.

Seminar on Implementation of East West Major Project in Secondary Schools and Teacher-Training Institutions in India, Bombay.

14th Annual General Meeting of the International Air Transport Association, New Delhi,

ECAFE Symposium on Development of Petroleum Resources in Asia and Far East, New Delhi.

Unesco Symposium on Origin, Cytogenetics and Breeding of Tropical Fruits, New Delhi.

A.
The names of the Ordinary Fellows of the Institute who attended various International Conferences are shown below :—

| | | |
|---|---------------------|---|
| Conference on law of the Sea (Geneva) | Feb.-April, 1958 | Dr. N. K. Panikkar |
| U. N. Statistical Commission (New York) | April-May 1958 | Prof. P. C. Mahalanobis |
| 10th Session of the Executive Committee of the World Meteorological Organisation (Geneva) | April-May, 1958 | Sri S. Basu |
| Delegation of Indian Scientists to U.S.S.R. to visit various laboratories | May, 1958 | Prof. M. S. Thacker, Dr. B. R. Nijhawan, Dr. P. Maheshwari, Dr. Atma Ram, Dr. C. Mahadevan, Dr. S. R. Palit, Dr. B. Mukerji |
| Delegation sponsored by the Development Council for Heavy Chemicals (Alakalis), Japan | May, 1958 | Dr. K. S. G. Doss |
| Regional Irrigation Practices Leadership Seminar (Tehran) | May, 1958 | Dr. H. L. Uppal |
| Fifth Session of the U. N. Scientific Committee on the Effects of Atomic Radiation (New York) | June, 1958 | Dr. H. L. Uppal |
| International Metallurgical Conference (Liege, Belgium) | June, 1958 | Dr. D. R. Malhotra |
| Fifth Session of the F. A. O. Desert Locust Control Committee (Rome) | June, 1958 | Dr. K. B. Lal |
| Chemical Engineering Conference (Paris) | June, 1958 | Dr. D. R. Malhotra |
| XII International Ornithological Congress (Helsinki) | June, 1958 | Sri Salim Ali |
| XI World Conference of International Committee for Bird Preservation (Helsinki) | June, 1958 | Sri Salim Ali |

| | | |
|---|--------------------|---|
| W.H.O. Seminar on 'Insecticide Resistance' (Panama) | June, 1958 | Dr. T. Ramachandra Rao |
| International Institute of Social Studies (The Hague) | June, 1958 | Prof. P. C. Mahalanobis |
| Darwin-Wallace Centenary (London) | July, 1958 | Prof. P. C. Mahalanobis |
| VII International Cancer Congress (London) | July, 1958 | Dr. V. R. Khanolkar |
| International Electro-technical Commission (Stockholm) | July, 1958 | Dr. G. R. Toshniwal |
| International Symposium on Chemotherapy of Cancer (Cambridge) | July, 1958 | Dr. V. R. Khanolkar |
| International Colloquium on Probability & applications (Paris) | July, 1958 | Dr. C. R. Rao |
| XV International Congress of Zoology (London) | July, 1958 | Dr. Vishwa Nath |
| International Symposium on High Polymers (International Union of Pure and Applied Chemistry) (Nottingham) | July, 1958 | Prof. S. R. Palit |
| Meeting of W.H.O. Expert Committee on Radiation (Geneva) | July-Aug. 1958 | Dr. V. R. Khanolkar |
| International Congress of Mathematicians (Edinburgh) | Aug. 1958 | Prof K. Chandrasekharan, Dr. Ram Behari, Dr. B. N. Prasad, Dr. R. P. Bambah |
| International Symposium on Nitrogen Metabolism of Plants (Reading, England) | Aug. 1958 | Dr. S. M. Sircar |
| Statistical Conference of the Royal Statistical Society of England (St. Andrews) | Aug. 1958 | Dr. C. R. Rao |
| International Biometric Conference (Ottawa) | Aug.-Sept. 1958 | Dr. C. R. Rao |
| Third General Assembly of the International Mathematical Union (St. Andrews, Scotland) | Aug. 1958 | Prof. K. Chandrasekharan |
| 120th Annual Conference of the British Association for Advancement of Science (Glasgow) | Aug.-Sept. 1958 | Dr. B. N. Prasad |
| 31st Session of the International Statistical Institute (Brussels) | Sept. 1958 | Dr. K. R. Nair, Dr. C. R. Rao |
| Eighth Quinquennial Conference of Vice-Chancellors of Commonwealth Universities (Toronto and Montreal) | Aug.-Sept. 1958 | Dr. Shri Ranjan, Dr. B. Prasad, Dr. P. Parija, Dr. A. C. Joshi. |

| | | |
|--|-----------------|-------------------------|
| Second U. N. International Conference in Peaceful uses of Atomic Energy (Geneva) | Sept. 1958 | Dr. H. J. Bhabha |
| 11th World Health Organisation Committee for South East Asia Session (New Delhi) | Sept. 1958 | Dr. Jaswant Singh |
| VI International Congress of Tropical Medicine and Malaria (Lisbon) | Sept. 1958 | Dr. R. N. Chaudhuri |
| Biennial Session, International Statistical Institute (Brussels) | Sept. 1958 | Prof. P. C. Mahalanobis |
| Pugwash Conference of Scientists (Kitzbuhel, Vienna) | Sept. 1958 | Prof. P. C. Mahalanobis |
| International Congress in Electron Microscopy (Berlin) | Sept. 1958 | Dr. N. N. Das Gupta |
| Commonwealth Conference of Nuclear Scientists (U. K.) | Sept. 1958 | Dr. H. J. Bhabha |
| International Ceramic Congress (Weisbaden, W. Germany) | Sept. 1958 | Dr. H. K. Mitra |
| III Session of Expert Committee on Plague, W.H.O. (Geneva) | Sept. 1958 | Dr. S. C. Seal |
| International Congress of Biochemistry (Vienna) | Sept. 1958 | Dr. B. C. Guha |
| Second General Conference of the International Atomic Energy Agency (Vienna) | Sept.-Oct. 1958 | Dr. H. J. Bhabha |
| UN/FAO Tokyo Training Centre (for delivering lectures) (Tokyo) | Sept.-Dec. 1958 | Dr. B. Ramamurti |
| 14th Session of Advisory Committee on Arid Zone Research of the UNESCO (Tehran) | Oct. 1958 | Dr. L. A. Ramdas |
| Conference of Scientific Society for Aviation (Stuttgart, W. Germany) | Oct. 1958 | Dr. V. M. Ghatare |
| 14th Annual General Meeting of the International Air Transport Association (New Delhi) | Oct. 1958 | Sri S. Basu |
| 1st Meeting of International Expert Committee on Health Laboratory Methods by WHO (Geneva) | Oct.-Nov. 1958 | Dr. V. S. Mangalik |
| ILO Seminar on Labour Statistics (Manila) | Nov. 1958 | Dr. B. Ramamurti |
| International Symposium on 'Chlorothiazide and other Diuretics' (Hongkong) | Nov. 1958 | Dr. R. J. Vakil |
| International House of Japan, and U.N. Regional Statistical Centre (Tokyo) | Nov. 1958 | Prof. P. C. Mahalanobis |

| | | |
|---|------------------|---|
| ECAFE Symposium on 'Development of Petroleum Resources in Asia and Far East, (New Delhi) | Dec. 1958 | Sri V. P. Sondhi, Dr. W. B. Metre, Dr. B. C. Roy, Dr. D. N. Wadia, Mr. P. Evans |
| International Symposium of origin, cytogenetics and Breeding of Tropical Fruits (New Delhi) | Dec. 1958 | Dr. B. P. Pal |
| Darwin-Wallace-Linnaeus Centenary and Bi-Centenary Congress (Singapore) | Dec. 1958 | Sri Salim Ali |
| Steel Delegation to China and Japan | 1958 | Dr. B. R. Nijhawan |
| All Union Conference on Medicinal Plants and All Union Conference on Antibiotics (Moscow and Leningrad) | 1958-59 | Dr. B. Mukerji |
| Standing Committee on Administration and Finance of W.H.O. Executive Board (Geneva) | Jan. 1959 | Dr. Jaswant Singh |
| W.H.O. International Expert Scientific Group on the Dissemination of Arthropod-borne Viruses by Birds, (Geneva) | March, 1959 | Sri Salim Ali |
| Sixth Session of the U.N. Scientific Committee on the Effects of Atomic Radiation (New York) | March-April 1959 | Dr. V. R. Khanolkar |
| F.A.O Regional Committee for South East Asia | 1958-59 | Dr. S. M. Sikka |
| International Rice Commission (Tokyo) | 1958-59 | Dr. S. M. Sikka |

B. Besides above, the following Fellows also visited the countries mentioned alongside.
 Dr. Ram Behari was invited to lecture at U.S. National Science Foundation Summer Institutes at Ohio.

Dr. M.R. Sahni visited by invitation Academia Sinica (Academy of Sciences of China) (Peking) and also U.S.S.R. for talks and discussions on Palaeontology with leading Palaeontologists.

Prof. S.R. Palit visited U.S.A. on lecture tour.

Dr. S.M. Sircar visited Research Institutes and Universities in Europe, U.S.A. and Japan and was invited to deliver lectures in U.S.A.

Prof. P.C. Mahalanobis delivered lectures and had discussions in the Academy of Sciences in Poland and Academy of Sciences of USSR.

APPENDIX VI
LIST OF PAPERS READ AT GENERAL MEETINGS

June 26, 1958

1. "Morphological characters of the human foot"—by S.S. Sarkar. (Communicated by Prof. K.P. Chattopadhyay).
2. "The evaluation of covolume function in hunt-hinds and goldies method of internal ballistics by the use of Russian tables"—by J. N. Kapur. (Communicated by Prof. P.L. Bhatnagar).
3. "A note on the solution of the equations of internal ballistics for the general Linear Law of burning"—by J.N. Kapur. (Communicated by Prof. P.L. Bhatnagar)
4. "Effects of variations of loading conditions on internal ballistics"—by J.N. Kapur. (Communicated by Prof. P. L. Bhatnagar).
5. "Structure and reproduction of Anabaena Randhawii Sp. Nov. with special reference to the classification of the species of Anabaena recorded from the Asiatic countries"—by G. S. Venkataraman. (Communicated by Dr. M.S. Randhawa).
6. "Effect of bore resistance on internal ballistics of guns for composite charge consisting of n component charges"—by V.B. Tawakley. (Communicated by Dr. R. S. Varma).
7. "Elasto-dynamic problem concerning a centre of rotation in a semi infinite medium of transversely isotropic material"—by Sakti Kanta Chakraborty. (Communicated by Dr. B. Sen).
8. "Oscillographic study of R/F oscillations in 'silent' electrical discharges"—by P. S. Venkataswamy Setty. (Communicated by Dr. S.R. Khastgir).
9. "Scattering of longitudinally polarised electron beam by a uniform magnetic field"—by Hari Das Banerjee. (Communicated by Prof. S. Gupta).
10. "Contribution to the embryology of Palmae I. Sabaleae"—by C. Venkataraman. (Communicated by Dr. A.C. Joshi).
11. "Improved measurements of absolute rate of B. disintegration using 4-counter technique"—by Narendra Nath and N.K. Saha.
12. "Sedimentological studies in Jharia and East Bokaro coal fields"—by K. Jacob, S.K. Ramaswamy, S.R.A. Rizvi and K. Krishnamurthy.
13. "Application of the 'Quasi-crystalline' mode for predicting the vapour-liquid equilibrium of some binary mixtures by using their boiling points"—by P.K. Katti and M.M. Chaudhuri. (Communicated by Prof. D.S. Kothari).
14. "Energy states of a one dimensional crystal with vacant lattice sites"—by A. Mozumdar. (Communicated by Prof. S. Gupta).

15. "Mineragraphic studies of some sulphide minerals veins near the trijunction of Bankura, Midnapore and Purulia districts, West Bengal"—by P.S. Chakravarty. (Communicated by Dr. S. Deb).
16. "Certain radiation-induced morphological abnormalities in *Crotalaria Juncea L.*"—by M.G. Srivastava. (Communicated by Prof. D.M. Bose).
17. "Gravitational instability of an infinite homogeneous and stationary turbulent medium"—by P.C. Jain. (Communicated by Prof. F.C. Auluck).
18. "Effect of Triiodothyronine on the genital organs in fertility in male rats"—by A. B. Kar, S. N. Roy and R. P. Das. (Communicated by Dr. B. Mukerji).
19. "Anomalous scattering of low energy Mu-mesons in copper"—by Nilima Basu and M.S. Sinha. (Communicated by Prof. D.M. Bose).
20. "Growth and development of septate and crystalliferous fibres in some Indian trees"—by S. K. Purkayastha. (Communicated by Prof. K.A. Chowdhury).
21. "Effect of hormone herbicides of Paddy (*Oryza Sativa L.*)"—by M.G. Srivastava. (Communicated by Dr. D.M. Bose).
22. "Physiological adaptation of dusky cotton bug, *oxycarenus hyalinipennis* (Costa) (Heteroptera; Lygaeidae) to its host plant, cotton, Pt. I. Digestive enzymes in relation to tissue"—by K.N. Saxena and Premlata Bhatnagar. (Communicated by Prof. M.L. Bhatia).
23. "On the cesaro summability of the ultraspherical series"—by D.P. Gupta. (Communicated by Dr. B.N. Prasad).
24. "New plant records for upper Gangetic plain"—by M.B. Raizada.
25. "Histochemical and histological studies in normal and folic acid and Vitamin B₁₂ deficient rats"—by S. Banerjee and A.R. Dravid.
26. "Observations on the nutrition of the crop spawn of the Mahanadi River"—by Indumati Das. (Communicated by Prof. B.S. Bhimachar).

August 30, 1958.

1. "Hyperconjugative effect in methyl pyridines"—by (Miss) Rama Bhattacharya. (Communicated by Prof. B.N. Ghosh).
2. "A note on the analytical solution of the equations of internal ballistics for a tapered-bore gun"—by J.N. Kapur. (Communicated by Prof. P.L. Bhatnagar).
3. "The general theory of moderated charges II"—by J.N. Kapur. (Communicated by Prof. P.L. Bhatnagar).
4. "On the Cesaro summability of the ultraspherical series II"—by D. P. Gupta. (Communicated by Dr. B.N. Prasad).
5. "A note on rotating configuration associated with toroidal magnetic field"—by S. Shankaranarayana Rao. (Communicated by Prof. P.L. Bhatnagar).
6. "A note on the unification of the classical orthogonal polynomials"—by A.K. Rajagopal. (Communicated by Prof. R. S. Krishnan).

7. "Metabolic changes in potato tubers under anaerobiosis"—by S. Ranjan and Vimla Budhraja.
8. "A study of nitrogen fixation in the detached root nodules of sunhemp"—by S. Ranjan and Vimla Budhraja.
9. Mechanism of resistance of paddy (*Oryza sativa L.*) to *Piricularia oryzae* Cav."—by S. Suryanarayanan. (Communicated by Prof. T.S. Sadasivan).
10. "A contribution to the knowledge of the diatomaceae of Kanya Kumari (Cape Comorin), India—II"—by G. S. Venkataraman. (Communicated by Dr. M. S. Randhawa).

October 17, 1958.

1. "Statistical distribution of cosmic ray stars in nuclear emulsions"—by Inder Sain Mittra and P.S. Gill.
2. "On the relative efficiencies of ban estimates based on doubly truncated and censored samples"—by B. Raja Rao. (Communicated by Dr. V.S. Huzurbazar).
3. "Tungsten bearing quartz veins around Chhendapahar, Bankura Dt., West Bengal, India—Their mineragraphy and genesis"—by P.S. Chakravarty. (Communicated by Dr. S. Deb).
4. "Mineralogenetic trends in the evolution of metamorphic rocks and origin of granites of East Manbhum, India"—by S. Sen. (Communicated by Dr. S. Deb).
5. "Studies on transplantations of adult mouse liver and Kidney into chick embryo"—by Leela Mulhelkar. (Communicated by Prof. T.S. Mahabale).
6. "Genus *Riccia* in India—III. Species of *Riccia* from the East Himalayan territory with description of a new species *R. attenuata* Pande sp. nov."—by S.K. Pande and Ram Udar. (Communicated by Prof. G.P. Majumdar).
7. "Notes on the habitat and habits of *Clevelandia ios* (Jordan and Gilbert)"—by R. Raghu Prasad. (Communicated by Dr. N.K. Panikkar).
8. "Reproduction in *Clevelandiaios* (Jordan and Gilbert), with an account of the embryonic and larval development"—by R. Raghu Prasad. (Communicated by Dr. N. K. Panikkar).
9. "Effect of adrenalectomy on the testis of cadmium chloride treated rats"—by Amiya B. Kar, J.N. Karkum and R. P. Das. (Communicated by Dr. B. Mukerji).
10. "Studies in the order Piperales IV. A contribution to the study of vegetative anatomy of some species of *Piper*"—By Y.S. Murthy. (Communicated by Prof. G.P. Majumdar).

December 5, 1958.

1. "Metamorphism of the banded iron formation of Badampahar, Mayurbhanj, India and the origin of the Cummingtonite-Magnetite rock"—by Kanai Lal Chakraborty (Communicated by Prof. S.Deb).
2. "Specific heat and thermal expansion of fluorspar"—by S Ganesan and R. Srinivasan. (Communicated by Prof. R.S. Krishnan).
3. "Some Tauberian theorems for Norlund summability"—by M.R. Parameswaran (Communicated by Dr. B.N. Prasad).

4. "Effect of thymol Blue, Night Blue and Methyl Violet on the capacity of the dropping mercuryelectrode"—by S.L. Gupta. (Communicated by Dr. K.S.G. Doss).
5. "Resistance in potential flow real fluids of prolate and oblate spheroids"—by N.L. Ghosh and H.K. Chatterjee. (Communicated by Prof. N.R. Sen).
6. "The near ultraviolet absorption spectrum of pyrrolidine"—by V. Santhamma. (Communicated by Prof. K. Rangadhama Rao).
7. "Observations on increased permeability during hypothermia and its effect on plasma proteins"—by Anubha Chowdhury, Anima Dutta, B.N. Koley and P.B. Sen. (Communicated by Prof. N.M. Basu).
8. "A statistical study of growth in parts of the second pair of chelipods in some species of the Indian fresh-water prawns of the genus *Palaemou*"—by R.K. Misra (Communicated by Dr. W.D. West).
9. "On the antibiotic properties of some constituents of *Mesus ferrea* Linn"—by D.P. Chakraborty, M. Purkayastha and P. K. Bose.
10. "Vascular anatomy of the flower of *Sphenoclea zeylanica* Gaerten and some other related species"—by D.P. Gupta. (Communicated by Dr. V. Puri).
11. "Long period afterglow KCL: TI phosphor under cathode ray excitation"—by V.V. Ratnam. (Communicated by Prof. S. Gupta).
12. "On growth of derivations of admissible functions"—by P.K. Kulshrestha. (Communicated by Prof. S.M. Shah).
13. "Studies on the age and growth of cirrhina mrigala (Ham) from river Ganga"—by V.G. Jhingran. (Communicated by Dr. B.S. Bhimachar).
14. "Some problems in Hydrodynamics of Non-Newtonian viscous Liquids with variable coefficient of cross viscosity"—by J.N. Kapur. (Communicated by Dr. P.L. Bhatnagar).

January 20, 1959.

1. "The Oviposition behaviour of diadromus (Thyraella) collaris gravenhorst (Ichneumonidae: HYM), A parasite of cabbage diamond-back moth, plutella maculipennis Curtis (Tineidae: Lep)"—by A.S. Atwal. (Communicated by Dr. H.S. Pruthi).
2. "The oviposition behaviour of bargada cruciferarum kirkaldy (Pentatomidae: Heteroptera) and the influence of temperature and humidity on the speed of development of eggs"—by A.S. Atwal. (Communicated by Dr. H.S. Pruthi).
3. "The skipper frog as a suitable embryological animal and an account of the action of mammalian hormones on spawning the same"—by L.S. Ramaswami and A.B. Lakshman.
4. "Application of charge independence to annihilation of anti-nucleons"—by S.K. Srinivasan. (Communicated by Prof. D.S. Kothari).
5. "Distribution of alkaline phosphates during the early development of pila virens (Lamarck)"—by K. Ramamorthi. (Communicated by Dr. B.R. Seshachar).

6. "Generalised affinity and a class of distance functions"-by S.R. Adke. (Communicated by Prof. V.S. Hazurbzar).

March 6, 1959.

1. "Functional morphology of the cloaca of varanus monitor (Linnaeus) in relation to water economy"—by Champaka Seshadri. (Communicated by Dr. M.L. Bhatia).
 2. "On the swimbladder and its connection with the internal ear in family cichlidae"—by P.V. Dehadrai. (Communicated by Prof. M.L. Bhatia).
 3. "On self reciprocal functions involving hypergeometric functions"—by V.V.L.N. Rao. (Communicated by Dr. S.K. Chakrabarty).
 4. "Structure of fluoride containing oxide glass in relation to the possible role of fluoride ion in the bitreous matrix"—by Bhuptai Kumar Banerjee. (Communicated by Prof. K. Banerjee).
 5. "A theorem on Meijer"—by S. K. Saxena. (Communicated by Dr. R.S. Varma).
 6. "Infinite integrals involving E-functions"—by K.C. Sharma. (Communicated by Dr. R.S. Varma).
 7. "On the inter-relationships between total length, standard length, depth and weight of lates calarifiers"—by D.N. Ganguly. (Communicated by Dr. G.P. Majumdar).
 8. "On summability functions for the circle family of methods"—by M.R. Parameswaran. (Communicated by Dr. B.N. Prasad).
 9. "Morphology of the alimentary canal of the larva of leucinodes orbonalis Guen (Lepidoptera, Phyraustidae)—by B.P. Srivastava. (Communicated by Dr. E. S. Narayanan).
 10. "Studies in Indian Tunicates: I. The germ cell in ecteinascidia thurstoni Herdman"—by S.R. Venkatasubba Rao, (Communicated by Prof. B.R. Seshachar).
 11. "The utilization of monosaccharides by Pestalotia Banksiane and P. Citri," — by R.N. Tandon and K.S. Bilgrami. (Communicated by Prof. P. Maheshwari).
 12. "On the absolute summability factors of infinite series" by G.D. Dikshit. (Communicated by Dr. B.N. Prasad).
 13. "Notes on three species of zygnemaceae from south India"—by G.S. Venkataraman. (Communicated by Dr. M. S. Randhawa).
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APPENDIX VII

LIST OF JOURNALS RECEIVED IN THE LIBRARY DURING 1958-1959

1. Abhandlungen der Deutschen Akademie der Wissenschaften zu Berlin, Klasse fur Chemie, Geologie and Biologie.
2. Abhandlungen der Deutschen Akademie der Wissenschaften zu Berlin, Klasse fur Mathematics,
3. Abhandlungen des Hessischen Landesamtes fur Bodenforschung, Weisbaden.
4. Acta Biologica, Academiæ Scientiarum Hungaricæ, Budapest.
5. Acta Botanica Fennica, Helsinki.

6. Acta Chimica, Academii Scientiarum Hungaricæ, Budapest.
7. Acta Geologica Polonica, Museum Ziemi, Warsaw.
8. Acta Mathematica, Academiæ Scientiarum Hungaricæ, Budapest.
9. Acta Metallurgica, Toronto, Canada.
10. Acta Physica, Academiæ Scientiarum Hungaricæ.
11. Acta Physica Polonica, Warszawa.
12. Acta Physica, Sinica Peking.
13. Acta Physiologica Academiæ Scientiarum Hungaricæ.
14. Acta Universitatis (Lunds Universitets Arsskrift) Nova Series.
15. Acta Zoologica Fennica, Helsingforsæ.
16. Agra University Journal of Research.
17. Agrokemia es Talajtan, Budapest.
18. Akademiai Ertesito, Budapest.
19. American Journal of Physics, New York.
20. American Museum Novitates, New York.
21. Annales Bogoriensis, Bogor
22. Annales Institutio Geologici Publici Hungarici, Budapest.
23. Annals of Biochemistry and Experimental Medicine, Calcutta.
24. Annals of Missouri Botanic Gardens, St. Louis, Missouri.
25. Annals of New York Academy of Sciences, New York.
26. Annals of South African Museum, Cape Town.
27. Annals of Tropical Medicine and Parasitology, Liverpool.
28. Archives des Sciences, Geneve.
29. Archiwum Gornictwa, Warsaw.
30. Archiwum Hutnictwa, Cracow.
31. Archives Internationales d' Historie des Sciences, Paris.
32. Armed Forces Medical Journal, N. Delhi.
33. Atti della Societa Italiana di Scienze Naturalie de Museo Civico, in Milano, Milan.
34. Australian Journal of Experimental Biology and Medical Science, Adelaide.
35. Australian Journal of Marine and Fresh Water Research, Melbourne.
36. Beaufortia, Amsterdam.
37. Berichte der Physikalisch Medizinischen Gesellschaft zu Wurzburg.
38. Bibliography of Scientific Publications of South and South East Asia, New Delhi.
39. Biological Abstracts, Philadelphia.
40. Biological Bulletin, Woods Hole.
41. Boletin del Centro de Documentacion Cientifica y Tecnica, Mexico.
42. Boletin do Museu Nacional Rio de Janeiro, Series Anthropologia.
43. Boletin do Museu Nacional Rio de Janeiro, Series Geologica.
44. Boletin do Museu Nacional Rio de Janeiro, Series Zoologica.
45. Botanical Magazine, Tokyo.
46. Bulletin de l' Academie Polonaise des Sciences, Warszawa. Series : Chimiques, Geology and Geography.
47. Bulletin de l' Academie Polonaise des Sciences Warszawa. Series : Mathematics, Astronomique and Physique.
48. Bulletin de l' Institut du Desert, Cairo.
49. Bulletin de l' Institut National Genevois.
50. Bulletin de l' Institute Royale des Sciences Naturalles de Belgique, Bruxelles.
51. Bulletin de la Societe Royale des Sciences de Liege.

52. Bulletin de la Societe Vaudoise des Sciences Naturalles, Lausanne.
53. Bulletin (International) de l' Academic Polonaise des Sciences (et des Letters) Cracovie.
54. Bulletin Mensuel de l' Observatoire Metereologique de l' Universite d' Uppsala.
55. Bulletin of the All India IMDA, Bombay.
56. Bulletin of the American Museum of Natural History, Woods Hole.
57. Bulletin of the Atomic Scientists, Chicago.
58. Bulletin of the British Non-Ferrous Metals Research Association, London.
59. Bulletin of the Calcutta Mathematical Society, Calcutta.
60. Bulletin of the Calcutta School of Tropical Medicine, Calcutta.
61. Bulletin of the Central Electrochemical Research Institute, Mysore.
62. Bulletin of the Central Food Technological Research Institute, Mysore.
63. Bulletin of the Central Leather Research Institute, Madras.
64. Bulletin of the Central Research Institute, Trivandrum.
 Series A. (Physical Sciences)
65. Bulletin of the Central Research Institute, Trivandrum.
 Series C. (Biological Sciences)
66. Bulletin of the Chicago Academy of Sciences, Chicago.
67. Bulletin of the Geological, Mining and Metallurgical Society of India, Calcutta.
68. Bulletins of the Geological Survey of India, Calcutta.
 Series A. (Economic Geology)
69. Bulletins of the Geological Survey of India, Calcutta.
 Series B. (Engineering Geology and Ground Water).
70. Bulletin of the Madras Government Museum, Madras.
71. Bulletin of the Mysore Geologists' Association, Bangalore.
72. Bulletin of the National Geographical Society of India, Banaras.
73. Bulletin of the National Museum of Ceylon.
74. Bulletin of the Research Council of Israel, Jerusalem.
 Section A, Mathematics, Physics and Chemistry.
75. Bulletin of the Research Council of Israel, Jerusalem.
 Section B, Biology and Geology.
76. Bulletin of the Research Council of Israel, Jerusalem.
 Section D, Botany.
77. Bulletin of the Scripps Institution of Oceanography of the University of California, La Jolla, California.
78. Bulletin—Organization for Scientific Research, Indonesia, Djakarta.
79. Bulletin of Central Glass and Ceramics Research Institute, Calcutta.
80. Bulletin—Calcutta Statistical Association, Calcutta.
81. California Agricultural Experiment Station—Bulletin.
82. California Agricultural Experiment Station—Circular.
83. Calcutta Medical Journal, Calcutta.
84. Chalmers Tekniska Hogskolas Handlingar, Gothenburg, Sweden.
85. Central Board of Geophysics;—Geophysical Digest, Calcutta.
86. Chemical Abstracts, Easton.
87. Chemical Reviews, Baltimore.
88. Chicago Academy of Sciences, Bulletins.
89. Chicago Academy of Sciences, Natural History Miscellanea.
90. Chicago Academy of Sciences, Special Publications.
91. Climatological data of U.S. Department of Commerce, Weather Bureau, Washington.

92. Collected Papers from the Faculty of Science, Osaka University, Osaka, Series B.
93. Collected Papers from the Faculty of Sceince, Osaka University, Osaka, Series C. (Chemistry & Biology) Osaka.
94. Comptes Rendus hebdomedaires des seances de l' Academie des Sciences, Paris.
95. Comptes Rendus Mensuels des seances de la classe des Sciences Mathematique et Naturelles, (Academie Polonaise des Sciences et des Letters), Cracow.
96. Contribution from the Dominion Observatory, Ottawa.
97. Contributions from the U. S. National Herbarium, Washington.
98. Cornell University Agricultural Experiment Station, Ithaca, Bulletin.
99. Cornell University Agricultural Experiment Station, Memoirs.
100. C. S. I. R. News, New Delhi.
101. Current Science, Bangalore.
102. Electrotehnisky, Vestnik, Belgrade.
103. Endeavour, London.
104. Fieldiana, Geology, Chicago.
105. Fieldiana, Zoology, Chicago.
106. F. R. I. News, Jealgora.
107. French Economic & Technical Bulletin, New Delhi
108. Fundamenta Mathematicæ, Warsaw.
109. Ganita, Lucknow.
110. Geophysical Memoirs, Meteorological Office, London.
111. Geographical Review of India, Calcutta.
112. Glasnik Mathematico Fizicki Astronomski, Zagreb.
113. Grosswetterlagen Mittel Europas, Bād Kissengen.
114. Half Yearly Journal of the Mysore University, Section B.
115. Harvard College Observatory, Cambridge, Mass, Annals of :
116. Harvard College Observatory, Cambridge, Bulletins.
117. Harvard College Observatory, Cambridge, Reprints.
118. Harvard College Observatory, Cambridge, Reprints. Series II.
119. Harvard College Observatory, Cambridge, Quarterly Reports.
120. Hilgardia, Berkeley.
121. Hungarian Technical Abstracts
122. Indian Central Jute Committee, Calcutta Agricultural Research, Memoir.
123. Indian Central Cotton Growing Review, Bombay.
- 123a. Indian Central Cotton Committee, Technological Laboratory Bombay.. Technologica. Bulletin Series A.
124. Indian Farming, Delhi.
125. Indian Forest Bulletin, Dehra Dun.
126. Indian Forest Leaflets, Dehra Dun.
127. Indian Forest Records, Dehra Dun.
128. Indian Forester, Dehra Dun.
129. Indian Journal of Agricultural Science, New Delhi.
130. Indian Journal of Dairy Science, Bangalore.
131. Indian Journal of Entomology, New Delhi.
132. Indian Journal of Genetics and Plant Breeding, New Delhi.
133. Indian Journal of Helminthology, Lucknow.
134. Indian Journal of Horticulture, New Delhi.
135. Indian Journal of Malariaiology, New Delhi.
136. Indian Journal of Medical Research, Kasauli.
137. Indian Journal of Meteorology and Geophysics, Delhi.
138. Indian Journal of Pharmacy, Bombay.

139. Indian Journal of Physics, Calcutta.
140. Indian Journal of Physiology and Allied Sciences, Calcutta.
141. Indian Journal of Power and River Valley Development, Calcutta.
142. Indian Journal of Psychology, Calcutta.
143. Indian Journal of Veterinary Science and Animal Husbandry, Delhi.
144. Indian Medical Gazette, Calcutta.
145. Indian Medical Research Memoirs, Delhi.
146. Indian Minerals, Calcutta
147. Indian Mining Journal, Calcutta.
148. Indian Phytopathology, Delhi.
149. Indian Standard, Delhi.
150. I. S. I. Bulletin, Delhi.
151. Indo-Pacific Fisheries Council, Bangkok;—Proceedings of :
152. Industrial & News Edition of the Journal of the Indian Chemical Society, Calcutta.
153. Insdoc List, New Delhi.
154. Industrial and Engineering Chemistry, Easton.
155. International Medical Abstracts and Reviews, Calcutta.
156. International Scientific Radio Union; Brussels ;—Bulletins of
157. Japanese Journal of Zoology, Tokyo.
158. Journal and Proceedings of the Institution of Chemists (India), Calcutta.
159. Journal and Proceedings of the Royal Society of New South Wales, Sydney.
160. Journal fur Hirnforschung, Akademie Verlag, Berlin.
161. Journal of Mines, Metals and Fuels, Calcutta.
162. Journal of Chemical Physics, Lancaster.
163. Journal of Research of the National Bureau of Standards, Washington.
164. Journal of Science of the Hiroshima University, Series A. (Mathematics, Physics, Chemistry).
165. Journal of Scientific & Industrial Research, New Delhi. Section A. General.
166. Journal of Scientific & Industrial Research, New Delhi. B and C Sections.
167. Journal of Scientific Research of the Banaras Hindu University, Varanasi.
168. Journal of Scientific Research in Indonesia, Djakarta.
169. Journal of Soil and Water Conservation in India, Hazari Bagh.
170. Journal of the American Medical Association, Chicago.
171. Journal of the Anthropological Society of Bombay, Bombay.
172. Journal of the Bombay Natural History Society, Bombay.
173. Journal of the Elisha Mitchell Scientific Society, N. Carolina University Press.
174. Journal of the Faculty of Science. Section Zoology, Hokkaido University, Sapporo, Japan.
175. Journal of the Franklin Institute, Philadelphia.
176. Journal of the Indian Botanical Society, Bangalore.
177. Journal of the Indian Chemical Society, Calcutta.
178. Journal of the Indian Institute of Science, Bangalore.
179. Journal of the Indian Mathematical Society, Madras.
180. Journal of the Indian Society of Agricultural Statistics, New Delhi.
181. Journal of the Indian Society of Soil Science, New Delhi.
182. Journal of the Institute of Fuel, London.
183. Journal of the Institute of Polytechnics, Osaka University, Osaka, Series C. Chemistry.
184. Journal of the Institute of Polytechnics, Osaka University, Series E. Engineering.
185. Journal of the Institute of Polytechnics, Osaka University, Series A. Mathematics.

186. Journal of the Institution of Engineers, Calcutta.
187. Journal of the Madras Institute of Technology, Madras.
188. Journal of the Optical Society of America, Pennsylvania.
189. Journal of the Science Club, Calcutta.
190. Journal of the Scientific Research Institute, Tokyo.
191. Journal of the Washington Academy of Sciences, Baltimore.
192. Journal of the Textile Institute, Manchester. Proceedings and Abstracts of :—
193. Journal of the Textile Institute, Manchester. Transactions.
194. Journal of the Zoological Society of India, Calcutta.
195. Kheti, Delhi.
196. Kitasato Archives of Experimental Medicine, Tokyo.
197. Kong. Danske Videnskabernes Selskab, Copenhagen. Matematik-fysiske Meddeleser.
198. Kong. Danske Videnskabernes Selskab, Copenhagen. Biologiske Meddeleser.
199. Kong. Danske Videnskabernes Selskab. Copenhagen. Biological Skrifter.
200. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam.
Proceedings Series A. Mathematical Series.
201. Koninklijke Proceedings Series B. Physical Series.
202. „ Proceedings Series C. Biological and Medical Series.
203. Kung. Svenska Vetenskapsakademiens, Stockholm. Handlingar. Fjärde Series.
204. La Cellule, Louvain.
205. List of Scientific Papers published in the Middle East, Cairo.
206. Mathematical Journal of Okayama University, Okayama.
207. Mathematical Scandinavica, Copenhagen.
208. Mathematical Reviews, Lancaster.
209. Mathematics Magazine, California.
210. Mathematics Student, Madras.
211. Mathematics Teacher, Washington.
212. Matematisk Tidsskrift, Copenhagen.
213. Memoirs of the Connecticut Academy of Arts and Sciences.
214. Memoirs of the Entomological Society of India, New Delhi.
215. Memoirs and Proceedings of the Manchester Literary and Philosophical Society,
Manchester.
216. Memoirs of the College of Agriculture, Kyoto University, Kyoto, Japan, Chemical
Series.
217. Memoirs of the Faculty of Engineering, Kyushu University, Fukuoka, Japan.
218. Memoirs of the Geological Survey of India, Calcutta.
219. Memoirs of the Indian Meteorological Department, Delhi.
220. Memoirs of the Queensland Museum.
221. Mitteilungen des Naturwissenschaftlichen Vereins fur Steiermark, Graz.
222. Nagoya Mathematical Journal, Japan.
223. Nature, London.
224. News Report, National Academy of Sciences and Natural Research Council,
Washington.
225. New Zealand Journal of Science and Technology, Wellington. Section A (Agricultural Research)
226. New Zealand Journal of Science and Technology, Wellington. Section B. (Agricultural Research).
227. Nordisk Matematisk Tidsskrift, Oslo.
228. Notes and Records of the Royal Society of London.

229. Notes of the Royal Botanic Gardens, Edinburgh.
230. Notizblatt des Hossischen Landesamtes fur Bodenforschung zu Wiesbaden.
231. Notulae des Hessischen of the Academy of Natural Sciences of Philadelphia.
232. Nuclear Science Abstracts, Oak Ridge.
233. Nucleonics, New York.
234. Occassional Papers of the California Academy of Sciences, San Francisco.
235. Osaka Mathematical Journal, Osaka.
236. Pacific Journal of Mathematics, Los Angeles.
237. Pacific Science, Hawaii.
238. Pakistan Journal of Science, Lahore.
239. Pakistan Journal of Scientific Research, Sections B and C.
240. Palaeobotanist, Lucknow.
241. Papers and Proceedings of the Royal Society of Tasmania.
242. Phillipines Journal of Science, Manila.
243. Philosophical Transactions of the Royal Society of London. Series A.
244. Philosophical Transactions of the Royal Society of London. Series B.
245. Physics Teacher, Calcutta.
246. Physical Review, New York.
247. Physics Abstracts, London.
248. Phytomorphology, Delhi.
249. Proceedings of the Academy of Natural Sciences of Philadelphia.
250. Proceedings of the American Academy of Arts and Sciences, Boston.
251. Proceedings of the California Academy of Sciences, San Francisco.
252. Proceedings of the Cambridge Philosophical Society, London.
253. Proceedings of the Indian Academy of Sciences, Bangalore, Section A.
254. Proceedings of the Indian Academy of Sciences, Bangalore, Section B.
255. Proceedings of the National Academy of Sciences, India, Allahabad, Section A.
256. Proceedings of the National Academy of Sciences, India, Allahabad, Section B.
257. Proceedings of the National Academy of Sciences of the U. S. A., Washington.
258. Proceedings of the Royal Institution of Great Britain.
259. Proceedings of the Royal Irish Academy, Dublin, Section A.
260. Proceedings of the Royal Irish Academy, Dublin, Section B.
261. Proceedings of the Royal Society, London, Series A.
262. Proceedings of the Royal Society, London, Series B.
263. Proceedings of the Royal Society of Edinburgh, Section A, (Mathematical and Physical Sciences).
264. Proceedings of the Royal Society of Edinburgh, Section B, (Biology).
265. Proceedings of the Royal Society of Victoria, Melbourne.
266. Proceedings of the U. S. National Museum (Smithsonian Institution), Washington.
267. Proceedings of the Zoological Society, Calcutta.
268. Progress of Theoretical Physics, Kyoto, Japan.
269. Psyche, a journal of entomology, Cambridge, Mass.
270. Public Health Reports, Washington.
271. Publicacoes do Instituto de Botanica, Dr. Goncalo Sampio da Faculdad de Ciencias da Universidade de Porto, Porto. Series. II.
272. Publications de la Faculty des Science de l' Universite Masaryk, Praha.
273. Publications de l' Institute du Desert, Heliopolis.
274. Publications de l' Institute Mathematique, Belgrade.

275. Publications of the Astronomical Society of Japan, Tokyo.
276. Publications of the Dominion Observatory, Ottawa.
277. Publications della Stazione Zoologica, Napoli.
278. Purdue University Agricultural Experiment Station, Lafayette, Circular.
279. Purdue University Agricultural Experiment Station, Lafayette, (Station Bulletin).
280. Quarterly Journal of the Geological, Mining & Metallurgical Society of India, Calcutta.
281. Quarterly of Applied Mathematics, Providence.
282. Quarterly Progress Report, Research Laboratory of Electronics, M. I. T., Cambridge, Mass.
283. Quarterly Progress Report, Solid State and Molecular Theory Group, M. I. T., Cambridge, Mass.
284. Records of the Australian Museum, Sydney.
285. Records of the Botanical Survey of India, Calcutta.
286. Records of the Indian Museum, Calcutta.
287. Records of the Geological Survey of India, Calcutta.
288. Reinwardtia, Bogor.
289. Report of the Department of Mines, Western Australia.
290. Research Applied in Industry, London.
291. Research Bulletin of the East Punjab University, Hoshiarpur.
292. Revista Cubana de Laboratorio Clinico, Cubana.
293. Sarawak Museum Journal, Kuching, Sarawak.
294. Schriften des Naturwissenschaftlichen vereins für Schleswig-Holstein, Kiel.
295. Science, Lancaster.
296. Science and Culture, Calcutta.
297. Science Museum Library, London. Monthly list of accessions to the Library.
298. Science Museum Library, London. Bibliographical Series.
299. Science Progress, London.
300. Scientia Sinica, Peking.
301. Scientific Papers of the College of General Education, University of Tokyo.
302. Scripta Mathematica, New York.
303. Seismological Bulletin. Meteorological Department, Government of India, New Delhi.
304. Sitzungsberichte, Abt. I. Biologie, Mineralogi etc., Wien.
305. Sitzungsberichte, der deutschen Academic der Wissenschaften zu Berlin. Class—Mathematics.
306. Sitzungsberichte der deutschen Academic der Wissenschaften zu Berlin. Class II.
307. Societas Scientiarum Fennica, Helsinki. Commentationes Biologicæ.
308. Soeietas Scientiarum Fennica, Helsinki. Commentationes Physico-Mathematicæ.
309. Soviet Physics, New York.
310. Statistical Newsletter.
311. Sudan Notes and Records, Khartoum.
312. Summaries of Reports of the Electrotechnical Laboratory, Tokyo.
313. Suomalaisen Tiedakatemian Toimituksia, Helsinki. Series A. Biologica.
314. Suomalaisen Tiedakatemian Toimituksia, Helsinki. Series B. Math.—Physics.
315. Technical News Bulletin (NBS.), Washington.
316. Technical Report, Solid State and Molecular Theory Group, M. I. T. Cambridge, Mass.
317. Technical Report, Research Laboratory of Electronics, Cambridge.
318. Technological Reports of the Osaka University, Japan.

319. Tensor, Sapporo, Japan.
320. Trabalhos do Instituto Botanica, Dr. Goncalo Sampaio, Porto.
321. Transactions and Proceedings of the Botanical Society of Edinburgh.
322. Transactions and Proceedings of the Royal Society of New Zealand.
323. Transactions of the American Mathematical Society, Providence.
324. Transactions of the Connecticut Academy of Arts and Sciences, New Haven.
325. Transactions of the Indian Institute of Chemical Engineers, Calcutta.
326. Transactions of the Mining, Geological and Metallurgical Institute of India, Calcutta.
327. Transactions of the New York Academy of Sciences, New York.
328. Transactions of the Royal Canadian Institute, Toronto.
329. Transactions of the Royal Society of Canada, Section III, Chemistry, Mathematics and Physical Sciences.
330. Transactions of the Royal Society of Canada. Section V, Biological Sciences.
331. Transactions of the Royal Society of New Zealand, Wellington.
332. Transactions of the Royal Society of South Africa.
333. Transactions of the San Diego Society of Natural History, San Diego.
334. Transactions of the Wisconsin Academy of Sciences, Madison.
335. Treubia, Bogor.
336. Tropical Agriculture, Trinidad.
337. UNESCO Bulletin for Libraries, Paris.
338. Union Geodesique et Geophysique. International Newsletter.
339. Universities Quarterly, London.
340. Utah Academy of Sciences, Arts and Letters, Salt Lake City. Proceedings.
341. U. S. Department of Commerce, Weather Bureau. Technical paper.
342. United States National Museum, Washington. Bulletins.
343. University of California, Agricultural Experiment Station. Bulletins.
344. University of California, Agricultural Experiment Station. Circulars.
345. University of California, Berkley, Publications in Botany . .
346. Verhandlungen der Geologischen Bundesanstalt, Wien.
347. Verhandlungen der Naturforschenden Gesellschaft in Basel.
348. Verhandlungen der Zoologisch-Botanischen Gesellschaft in Wien.
349. Vijnan Karmee, Delhi.
350. Vigyan Pragati (Hindi), Delhi.
351. Witterungsberichte, Bad Kissingen.
352. W. M. O. (World Meteorological Organization), Geneva, Bulletin.
353. Zeitschrift fur Naturforschung, Tubingen.
354. Zoologica, New York.
355. Zoological Survey of India;—Quarterly Bulletin :
- Russian Journals : Titles translated into English
356. Astronomicheski zhurnal (Astronomical Journal).
357. Biokhemia (Biochemistry).
358. Doklady Akademii Nauk, SSSR.
359. Izvestiia Akademii Nauk, SSSR, Seria matematicheskaiia (Bulletin of the Academy of Sciences of the USSR, Mathematical Series).
360. Izvestiia Akademii Nauk, SSSR : Seria biologicheskaiia (Bulletin of the Academy of Sciences of the USSR, Biological Series).
361. Matematicheskii sbornik (Mathematical Symposium).
362. Mikrobiologia (Microbiology).

- 363. Priroda (Nature).
 - 364. Referativnyi zhurnal (Reference Journal) : : Mathematical Series
 - 365. " " " " : Physical Series.
 - 366. " " " " : Chemical Series.
 - 367. " " " " : Astronomical Series.
 - 368. " " " " : Mechanical Series.
 - 369. Uspekhi sovremennoi biologii (Achievements of Contemporary Biology)
 - 370. Vestnik Akademii Nauk SSSR.
 - 371. Zoologicheskii zhurnal (Zoological Journal).
 - 372. Zhurnal obschei biologii (Journal of General Biology).
-

APPENDIX VIII
OFFICE STAFF 1958-59.

Delhi

| | | |
|---------------------------|-----|-----------------|
| Offg. Assistant Secretary | ... | H. Sengupta |
| Accountant | ... | A. R. Bhutani |
| Stenographer | ... | M. R. Sharma |
| Office Assistant | ... | M. S. Nigam |
| Assistant Librarian | ... | Ram Rakha |
| Clerk Typists | ... | J. Singh |
| | ... | K. N. Chibber |
| Record Keeper | ... | Sitaram Kataria |

Calcutta

| | | |
|-----------------------|-----|-----------------|
| Assistant Editor | ... | K. R. Sen |
| Sub-Editor | ... | (Mrs.) S. Mitra |
| Publication Assistant | ... | S. N. Banerjee |
| U. D. Clerk | ... | A. Sengupta |

NATIONAL INSTITUTE

Balance Sheet as at

LIABILITIES

Rs. nP. Rs. nP. Rs. nP.

Sundry Donations and Fellows Funding Account :

Donations. 36,400.03

Fellows Funding & Compounding Fee :

Balance as per last Balance Sheet 25,240.00

Receipts during the year 1,136.00 26,376.00 62,776.03*Chandra Kala Hora Memorial Medal Endowment Fund :*

Balance as per last Balance Sheet 3,900.75

Add : Interest during the year. 100.00 4,000.75*General Fund :*

Balance as per last Balance Sheet 1,82,908.31

Add : Income Over Expenditure as per annexed Account 57,560.75 2,40,469.06*Building Fund :*

Balance as per last Balance Sheet 2,90,000.00

*Government Grant for Building Extension Account :**I.C.I. Research Fellowship Fund :*

Balance as per last Balance Sheet 5,569.16

Add : Excess of Income over expenditure as per annexed Account 751.91 6,321.07*Temporary Reserve Fund :*

Balance as per last Balance Sheet 50,587.27

Add : Amount of Govt. Grant received towards deficit of previous year 39,100.00 89,687.27*Popularisation of Science Fund :*

Balance as per last Balance Sheet 3,792.97

*Grant for National Register of Scientific and**Technical Personnel :*Balance as per last Balance Sheet 462.62

Carried over ... 7,47,509.77

IX

OF SCIENCES OF INDIA

31st March, 1959

ASSETS

| | Rs. nP. | Rs. nP. |
|---|--------------|------------------------------|
| <i>Building & Equipments :</i> | | |
| Balance as per last Balance Sheet | ... ... | 2,90,811.77 |
| <i>Furniture & Fixtures :</i> | | |
| Balance as per last Balance Sheet | ... ... | 37,782.92 |
| Additions during the year—Office Furniture | ... ... | 5,049.00 |
| Additions during the year—Library Furniture | ... ... | <u>696.59</u> 43,528.51 |
| <i>Library Books & Journals :</i> | | |
| Balance as per last Balance Sheet | ... ... | 1,57,849.96 |
| Additions during the year | ... ... | <u>52,345.92</u> 2,10,195.88 |
| <i>Building Extension Account :</i> | | 9,050.00 |
| <i>Sundry Debtors :</i> | | 1,013.20 |
| <i>Advances :</i> | | |
| To Staff & Others | ... ... | 2,861.72 |
| To Research Fellows | ... ... | 800.00 |
| To Supervisors Research Fellows | ... ... | 1,000.00 |
| To Progress of Science Reviews | ... ... | 500.00 |
| To Editor's Office Delhi | ... .. | <u>302.24</u> 5,463.96 |
| <i>Outstanding Subscription :</i> | | |
| For the year 1955 | ... ... | 156.00 |
| For the year 1956 | ... ... | 216.00 |
| For the year 1957 | ... ... | 148.50 |
| For the year 1958 | ... ... | 173.64 |
| For the year 1959 | ... ... | <u>1,744.00</u> 2,438.14 |
| <i>Sundry Deposits :</i> | | |
| For Electric Meter | ... ... | 25.00 |
| Advance against Telephone Calls (Calcutta Office) | ... ... | <u>70.00</u> 95.00 |
| <i>Suspense (Dr.).</i> | | |
| Balance as per last Balance Sheet | ... ... | 50.00 |
| | Carried over | ... 5,62,646.46 |

APPENDIX

NATIONAL INSTITUTE

Balance Sheet as at

LIABILITIES

| | Rs. nP. | Rs. nP. |
|--|---|-------------|
| | <i>Brought Forward</i> | 7,47,509.77 |
| <i>Indian Science Abstracts Fund :</i> | | |
| Balance as per last Balance Sheet | 17,160.11 | |
| Less: Payments made during the year | <u>1,720.00</u> | 15,440.11 |
| <i>Maintenance of Building Reserve :</i> | | |
| Balance as per last Balance Sheet | ... ... | 2,000.00 |
| <i>Maintenance of Lawns & Gardens Reserver</i> | | |
| Balance as per last Balance Sheet | ... ... | 800.00 |
| <i>Employees' Provident Fund :</i> | | |
| Balance as per last Balance Sheet | 30,272.71 | |
| Add: Members' Contribution | 3,070.96 | |
| Institute's Contribution | 3,070.96 | |
| Interest | 659.98 | |
| | <u>37,074.61</u> | |
| Less: Payment during the year | <u>6,220.58</u> | 30,854.03 |
| <i>Accountant's Security :</i> | | |
| Balance as per last Balance Sheet | 2,000.00 | |
| Interest for 1957-58 | <u>70.00</u> | |
| | <u>2,070.00</u> | |
| Add: Interest for 1958-59 | <u>70.00</u> | |
| | <u>2,140.00</u> | |
| Less: Interest paid during the year (for 1957-58) | <u>70.00</u> | 2,070.00 |
| <i>Suspense : (Cr.)</i> | | |
| Balance as per last Balance Sheet | ... ... | 21.94 |
| <i>Other Liabilities:</i> | | |
| Sundry Creditors | 1,118.39 | |
| Income Tax Payable | 211.50 | |
| Security for Books | 10.00 | |
| Security from Building Contractor | 10,000.00 | |
| Subscription Received in Advance | 172.06 | |
| Stipend payable Research Fellows | <u>3,725.00</u> | 15,236.95 |
| <i>Retention Money Research Fellows :</i> | | |
| | <u>20,367.50</u> | |
| <i>Dr. S. S. Bhatnagar Memorial Fund :</i> | | |
| | <u>5,366.25</u> | |
| | <u>8,39,666.55</u> | |

IX (Contd.).

OF SCIENCES OF INDIA

31st March, 1959—(Contd.)

ASSETS

| | Rs. nP. | Rs. nP. |
|--|------------|--------------------|
| Brought Forward | | 5,62,646.46 |
| <i>Investment : At cost</i> | | |
| 4% Loan 1960/70 Face Value Rs. 17,000/- ... | ... | 47,189.24 |
| 3% Conversion Loan Face Value Rs. 29,600/- | ... | |
| (Includes Securities of the face value of Rs. 3,000/- for Chandra Kala Hora Memo- rial Medal Fund and Securities of the face value of Rs. 43,600/- for Funding Account and Donations). | | |
| <i>Treasury Bonds :</i> | | |
| 3½% 10 year Treasury Deposit certificates ... | ... | 42,000.00 |
| Against Accountant's Security ... | ... | Rs. 2,000/- |
| Reserve Fund ... | <u>...</u> | <u>40,000/-</u> |
| <i>Bank and Other Balances :</i> | | |
| Amount in Petty Cash ... | ... | 158.64 |
| Imprest Amount with Asst. Editor, Calcutta ... | ... | 399.65 |
| Postage Franking Machine (Pending Decision of theft case and reported to be recovered). ... | ... | 241.55 |
| Postage Stamps in office ... | ... | 115.04 |
| Postage Stamps with Library ... | <u>...</u> | <u>155.14</u> |
| | | 1,070.02 |
| <i>Balances with State Bank of India, Delhi</i> | | |
| In Fixed Deposit Receipts ... | ... | 49,378.00 |
| Against Provident Fund Account 26,561.00 | ... | |
| Against Funding Account 10,877.00 | ... | |
| Against Reserve Fund 11,940.00 | <u>...</u> | <u>49,378.00</u> |
| In Employees Provident Fund Savings Account 4,293.03 | ... | |
| ,, Savings Bank Account 8,710.54 | ... | |
| ,, Current Account 1,21,469.79 | ... | |
| <i>Balance with State Bank of India—Calcutta</i> | | |
| In Current Account ... | ... | 2,909.47 |
| | | 1,86,760.83 |
| | | <u>8,39,666.55</u> |

Note : No Depreciation has been provided on Assets.

AUDITORS' REPORT

We report that we have examined the above Balance Sheet of the National Institute of Sciences of India as at 31st March 1959, and also the relevant Income and Expenditure Account and Receipts and Payments Account of the Institute for the year ended on that date. In our opinion, the Balance Sheet shows a true and correct view of the state of affairs of the Institute according to the best of our information and explanations given to us and as shown by the Books of the Institute.

Lodha & Co.
Chartered Accountants

1B, Old Post Office Street,
Calcutta, the 6th day of July 1959.

NATIONAL INSTITUTE

Income and Expenditure Account for

EXPENDITURE

Rs. nP. Rs. nP.

To Expenditure out of Government Grant :

| | | | |
|---------------------------------------|-----|-----|---------------------------|
| Staff Salaries including Allowances | ... | ... | 66,029.65 |
| Provident Fund Contribution Institute | ... | ... | <u>3,070.96</u> 69,100.61 |

,, N. I. S. Research Fellowships :

| | | | |
|--|-----|-----|-----------------------------|
| Stipends paid to Senior Research Fellows | ... | ... | 32,580.63 |
| Stipends paid to Junior Research Fellows | ... | ... | 74,698.91 |
| Contingencies paid to Seniors | ... | ... | 2,588.51 |
| Contingencies paid to Juniors | ... | ... | 5,659.76 |
| Advertisement Research Fellows | ... | ... | <u>1,326.26</u> 1,16,854.07 |

,, Travelling Expenses for Meetings :

... 66,399.73

,, Publication Expenses of Institute :

| | | | |
|----------------------------|-----|-----|----------------------------|
| Proceedings & Transactions | ... | ... | 41,836.71 |
| Symposia Bulletins | ... | ... | <u>23,398.58</u> 65,235.27 |

,, Publication Grants to other Societies :

... 40,050.00

,, Library Recurring Expenses :

352.98

(Rs. 52,345.92 nP. spent on Books & Journals and
 Rs. 696.59 nP. spent on Library furniture are
 shown as assets in the Balance Sheet).

,, Contingency Expenses :

| | | | |
|---|-----|-----|-------------------------|
| Rent of Land (Up to 14th July 1959) | ... | ... | 5,625.00 |
| House Tax | ... | ... | 5,625.40 |
| Printing & Stationery | ... | ... | 2,279.23 |
| Postage, Telegram and Telephone Charges | ... | ... | 4,420.76 |
| Maintenance of Buildings | ... | ... | 1,976.00 |
| Anniversary Meeting Expenses | ... | ... | 1,171.25 |
| Maintenance of Lawns & Gardens | ... | ... | <u>790.42</u> 21,888.06 |

,, Expenses out of General Fund :

| | | | |
|-----------------------------|-----|-----|-----------------|
| Electricity & Water Charges | ... | ... | 563.10 |
| Conveyance | ... | ... | 709.80 |
| Bank Charges | ... | ... | 189.08 |
| Miscellaneous expenses | ... | ... | <u>2,019.94</u> |
| | | | 3,481.92 |

Carried over ... 3,79,880.72

X

OF SCIENCES OF INDIA

the year ended 31st March 1959.

| INCOME | Rs. nP. | Rs. nP. |
|--|-----------------|-------------|
| By Government Grant-in-Aid 1958-1959 | ... | 4,26,000.00 |
| ,, Government grant towards deficit of previous year | ... | 39,100.00 |
| ,, Grant Universities | ... | 1,300.00 |
| ,, Sale of Publications | ... | 5,279.15 |
| ,, Membership Subscription 1959 | | |
| Actual Amount received | 6,776.00 | |
| Amount receivable | <u>1,744.00</u> | 8,520.00 |
| ,, Interest on Investments | | 3,462.00 |
| ,, Miscellaneous Receipts | | 470.10 |
| | | |
| Carried over .. | | 4,84,131.25 |

NATIONAL INSTITUTE

Income and Expenditure Account

EXPENDITURE

| | Rs. nP. | Rs. n.P. |
|--|----------------------|--------------------|
| Brought Forward | ... 3,481.92 | 3,79,880.72 |
| To Expenses out of General Fund (Contd.) | | |
| Meeting Expenses, Council and Zonal Meetings | ... 740.69 | |
| Subscription to I. S. I. | ... 250.00 | |
| Rent and Rates | ... 248.00 | |
| Insurance on Building | ... 252.62 | |
| Allowances for Secretarial Assistant | ... 525.00 | |
| Monthly Telephone Charges—Office bearers | ... 725.81 | |
| Symposium Expenses | ... 301.98 | |
| Audit Fee | ... 350.00 | |
| Excess Expenditure on Solar Energy & Wind Power written off | ... 689.76 | |
| Subscription to Co-operating academies on behalf of Fellows | ... 24.00 | 7,589.78 |
| ,, Transfer to Temporary Reserve Fund being Govt. Grant received towards deficit of previous year | ... 39,100.00 | |
| ,, Excess of Income over Expenditure transferred to General Fund* | ... 57,560.75 | |
| | Total Rs. ... | 4,84,131.25 |

Imperial Chemical Industries (India)

| | |
|--|------------------|
| To I. C. I. Research Fellowship Stipends | ... 24,158.71 |
| ,, I. C. I. Research Fellowship contingencies | ... 2,217.93 |
| ,, Excess of Income Over Expenditure transferred to I.C.I. Research Fellowship Fund | ... 751.91 |
| | 27,128.55 |

Note : *Represents following Capital Additions during
the year as shown in the Balance Sheet
Library Books & Journals.

Rs. 52,345.92

| | |
|----------------------------|------------------|
| Library Furniture | 696.59 |
| Office Furniture & Fixture | 5,049.00 |
| | 58,091.51 |

| | |
|--|------------------|
| Less : Excess of payment over receipts as per annexed Receipts & Payments Account | ... 530.76 |
| | 57,560.75 |

1-B, Old Post Office Street,
Calcutta, the 6th day of July, 1959.

X—(Contd.)

OF SCIENCES OF INDIA

for the year ending 31st March, 1959.—(Contd.)

INCOME

| | Rs. nP. | Rs. nP. |
|-----------------|---------|-------------|
| Brought Forward | | 4,84,131.25 |
| | | <hr/> |
| | | 4,84,131.25 |

Research Fellowships

| | |
|--|---------------|
| By I. C. I. Research Fellowship Grant Scheme No. II. | 24,158.71 |
| Balance brought forward from last year | ... 400.00 |
| Actual Amount received during the year | ... 23,758.71 |
| „ I. C. I. Research Fellowship contingency grant | 2,969.84 |
| | <hr/> |
| | 27,128.55 |
| | <hr/> |

This is the Income & Expenditure Account referred to in our report of even date.

Sd/- LODHA & CO.
Chartered Accountants.

APPENDIX

NATIONAL INSTITUTE

*Receipts and Payments Account***I. Government****RECEIPTS**

| | | Rs. nP. | Rs. nP. |
|--|-----|---------|-------------|
| To Government Grant in aid 1958-59 | ... | ... | 4,26,000.00 |
| ,, Government Grant to meet deficit of 1957-58 | ... | ... | 39,100.00 |
| ,, Sale of Publications | ... | ... | 5,279.15 |
| , Excess of Payments over Receipts. | ... | ... | 1,644.08 |

| | |
|----------------------|--------------------|
| Total Rs. ... | 4,72,023.23 |
|----------------------|--------------------|

OF SCIENCES OF INDIA

for the year ended 31st March 1959

Grant-in-Aid

PAYMENTS

| | | | Rs. | nP. | Rs. | nP. |
|--|-----|---------------|-----------|-----|-------------|-----|
| By Staff Salaries & Other Allowances | ... | ... | | | 66,029.65 | |
| ,, Provident Fund Contribution Institute | ... | ... | | | 3,070.96 | |
| ,, Travelling Expenses for meetings | ... | ... | | | 66,399.73 | |
| ,, N. I. S. Research Fellowships : | | | | | | |
| Stipends paid to Senior Fellows | ... | ... | 32,580.63 | | | |
| Stipends paid to Junior Fellows | ... | ... | 74,698.91 | | | |
| Contingencies to Senior Fellows | ... | ... | 2,588.51 | | | |
| Contingencies to Junior Fellows | ... | ... | 5,659.76 | | | |
| Advertisement Research Fellows | ... | ... | 1,326.26 | | 1,16,854.07 | |
| ,, Library: | | | | | | |
| Books & Journals | ... | ... | 52,345.92 | | | |
| Furniture | ... | ... | 696.59 | | | |
| Expenses (Postage) | ... | ... | 352.98 | | 53,395.49 | |
| ,, Publication : | | | | | | |
| (a) Proceedings & Transactions | ... | ... | 41,836.71 | | | |
| Symposia Bulletins | ... | ... | 23,398.56 | | | |
| (b) Publication grants to other societies | ... | ... | 40,050.00 | | 1,05,285.27 | |
| ,, Contingency : | | | | | | |
| Rent of Land | ... | ... | 5,625.00 | | | |
| House Tax | ... | ... | 5,625.40 | | | |
| Printing & Stationery | ... | ... | 2,279.23 | | | |
| Postage & Telegrams | ... | ... | 4,420.76 | | | |
| Maintenance of Building | ... | ... | 1,976.00 | | | |
| Maintenance of Lawns & Gardens | ... | ... | 790.42 | | | |
| Anniversary meeting expenses | .. | ... | 1,171.25 | | 21,888.06 | |
| ,, Amount transferred to Temporary Reserve | | | | | | |
| Fund being Govt. Grant received to meet deficit of 1957-58 | ... | ... | | | 39,100.00 | |
| | | Total Rs. ... | | | 4,72,023.23 | |

APPENDIX

NATIONAL INSTITUTE

Receipts and Payments Account

II. General

RECEIPTS

| | Rs. nP. |
|--------------------------------------|--------------------------|
| To Grant Universities | ... 1,300.00 |
| ,, Fellowship Subscription 1958-59 : | |
| Received | 6,776.00 |
| Receivable | <u>1,744.00</u> 8,520.00 |
| ,, Interest on Investment | 3,462.00 |
| ,, Miscellaneous Receipts | 470.10 |
| | 13,752.10 |

III. I. C. I. Research

| | |
|--|-----------------|
| To I. C. I. Research Fellowships Grant | 24,158.71 |
| ,, I. C. I. Contingency grant | <u>2,969.84</u> |
| Total Rs. ... | 27,128.55 |

XI (Contd.)

OF SCIENCES OF INDIA

for the year ended 31st March, 1959—(Contd.)

Fund

PAYMENTS

Rs. nP.

| | |
|---|-----------|
| By Electricity and Water Charges. | 563.10 |
| „ Audit Fee | 350.00 |
| „ Payments to Co-operating academies on behalf Fellows | 24.00 |
| „ Rent and Rates | 248.00 |
| „ Conveyance | 709.80 |
| „ Bank Charges | 189.08 |
| „ Subscription to Indian Standards Institution | 250.00 |
| „ Insurance on Building | 252.62 |
| „ Meeting Expenses (Including Council and Zonal Meetings) | 740.69 |
| „ Miscellaneous Expenses | 2,019.94 |
| „ Allowances for Secretarial Assistance | 525.00 |
| „ Symposium Expenses | 301.98 |
| „ Monthly Telephone Expenses Office bearers | 725.81 |
| „ Excess Expenditure on Solar Energy and wind power written off | 689.76 |
| „ Office Furniture | 5,049.00 |
| „ Excess Receipts over Payments | 1,113.32 |
| | 13,752.10 |

Fellowships

| | |
|---|-----------|
| By I. C. I. Research Fellowships stipends | 24,158.71 |
| Balance brought forward from last year | 400.00 |
| Paid during the year | 23,758.71 |
| „ I. C. I. Research Fellows contingencies | 2,217.93 |
| „ Excess Receipts over Expenditure | 751.91 |
| Total Rs. ... | 27,128.55 |

Signed for Identification.
 Sd/- LODHA & CO.
 Chartered Accountants.

NATIONAL INSTITUTE

Budget estimates for 1959-60

I Government

RECEIPTS

| | Revised Estimates 1958-59 | Actuals 1958-59 | Estimates 1959-60 |
|----------------------|---------------------------------|----------------------|----------------------|
| | Rs. | Rs. | Rs. |
| Government Grant | ... 4,39,546 | 4,26,000 | 6,07,400 |
| Sale of Publications | ... 5,000 | 5,279 | 5,000 |
| | | | |
| | <hr/> <hr/> 4,44,546 | <hr/> <hr/> 4,31,279 | <hr/> <hr/> 6,12,400 |

XII

OF SCIENCES OF INDIA

and Actuals for 1958-59

Grant-in-aid—Recurring

EXPENDITURE

| | Revised Estimates 1958-59 | Actuals 1958-59 | Estimates 1959-60 |
|---|---------------------------------|---------------------|----------------------|
| | Rs. | Rs. | Rs. |
| G. I. Salaries including allowances & P. F. | ... 69,070 | 69,101 | 90,000 |
| G. 2. Travelling | ... 68,000 | 66,400 | 65,000 |
| G. 3. NIS Research Fellowships | ... 1,19,868 | 1,16,854 | 2,08,000 |
| G. 4. Library | ... 50,000 | 53,396 | 80,000 |
| G. 5. Publications : | | | |
| (i) Institute | ... 72,697 | 65,235 | 1,04,200 |
| (ii) Other societies | ... 40,000 | 40,050 | 40,050 |
| G. 6. Contingencies | | | |
| (i) Rent of land | .. 5,625 | 5,625 | 5,625 |
| (ii) House Tax | ... 5,625 | 5,625 | 5,625 |
| (iii) Maintenance Buildings | ... 3,911 | 1,976 | 3,650 |
| (iv) Maintenance lawns & gardens | ... 2,000 | 791 | 2,000 |
| (v) Printing & Stationery | ... 3,000 | 2,279 | 3,500 |
| (vi) Postage & Telegrams | ... 4,750 | 4,421 | 4,750 |
| (vii) Anniversary Meeting expenses. | ... — | 1,171 | — |
| | 4,44,546 | 4,32,924 — 1,645 | |
| | 4,44,546 | 4,31,279 | 6,12,400 |

APPENDIX

NATIONAL INSTITUTE

Budget estimates for 1959-60

II. General

RECEIPTS

| | | Revised Estimates 1958-59 | Actual 1958-59 | Estimates 1959-60 |
|---|-----|---------------------------------|-------------------|----------------------|
| | | Rs. | Rs. | Rs. |
| 1. Subscriptions | | | | |
| Annual subscriptions | ... | 8,750 | 8,484 | 8,600 |
| Compounding fees | ... | 500 | 720 | 500 |
| Admission fees | ... | 480 | 426 | 480 |
| 2. Grants | | | | |
| Calcutta University | ... | 500 | — | 1,000 |
| Osmania " | ... | 600 | 300 | 600 |
| Bombay " | ... | 1,000 | 1,000 | 500 |
| Interest Chandra Kala Hora Medal Fund | | 100 | 100 | 100 |
| 3. Sale of Publications | ... | 5,000 | 5,279 | 5,000 |
| 4. Miscellaneous | | | | |
| (a) Interest on investments and rent recoveries, etc. | ... | 3,750 | 3,857 | 3,900 |
| (b) Sale apparatus research fellows | ... | 200 | 75 | 100 |
| 5. Transfer from funds | | | | |
| (a) Review Progress of Science (from I. S. A. Fund) | ... | 2,640 | 1,720 | 2,000 |
| (b) ICI Res. Fellowship Fund (for Special grants) | ... | — | — | 2,000 |
| (c) Dr. S. S. Bhatnagar Memorial Fund | ... | — | — | — |
| | | <hr/> 23,520 | <hr/> 21,961 | <hr/> 24,780 |

III. I. C. I.

| | | | | |
|-------------------|-----|--------------|--------------|--------------|
| Stipends Grant | ... | 24,159 | 24,159 | 16,800 |
| Contingency Grant | ... | 2,970 | 2,970 | 2,100 |
| | | <hr/> 27,126 | <hr/> 27,129 | <hr/> 18,900 |

XII (Contd.)

OF SCIENCES OF INDIA

and Actuals for 1958-59—(Contd.)

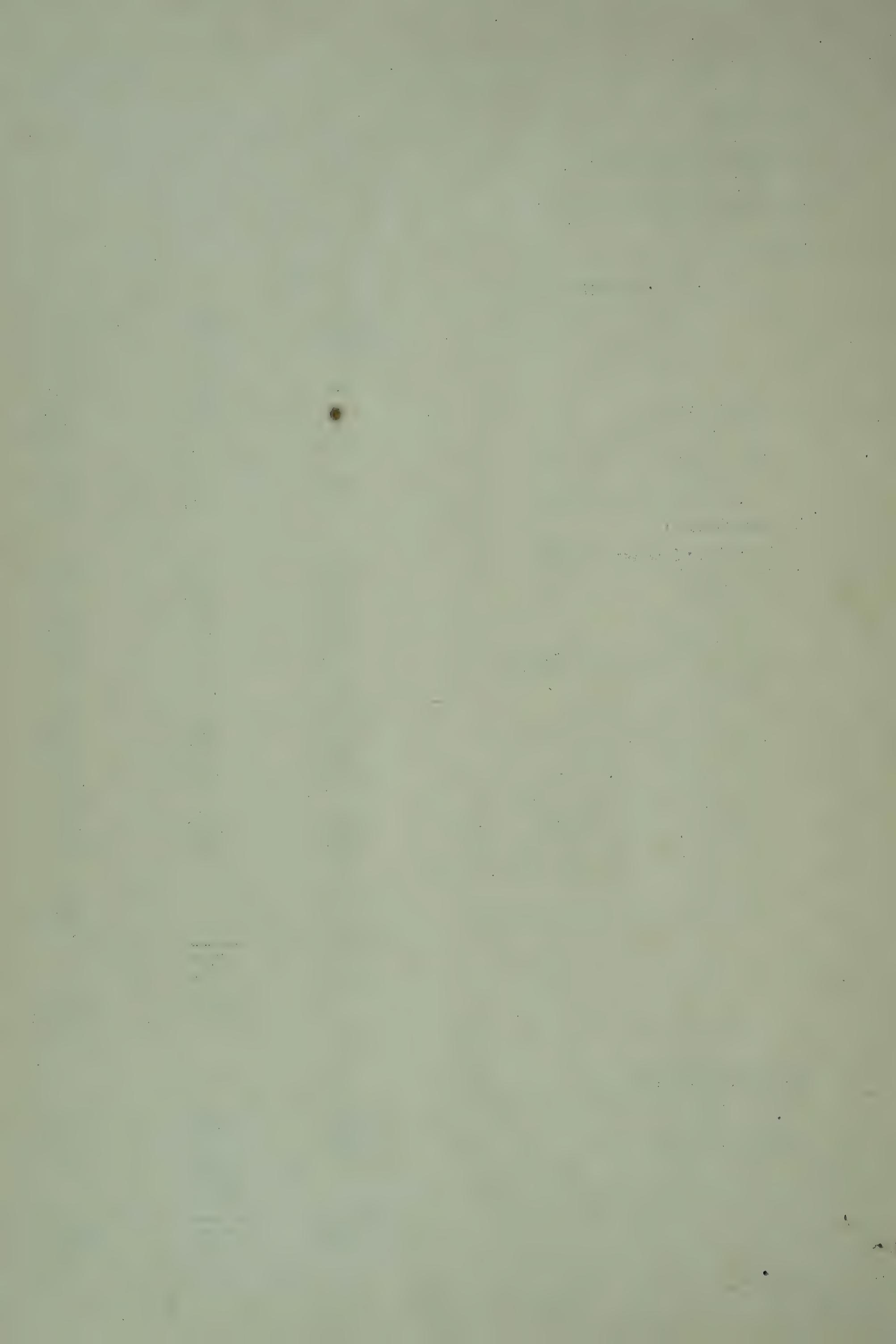
Fund

EXPENDITURE

| | | Revised Estimates 1958-59 | Actuals 1958-59 | Estimates 1959-60 |
|---|-------|---------------------------------|--------------------|----------------------|
| | | Rs. | Rs. | Rs. |
| 1. <i>Funding Account</i> | ... | 1,080 | 1,246 | 1,080 |
| 2. <i>Rent, Rate & Taxes</i> | ... | 950 | 318 | 350 |
| 3. <i>Payment other Institutes</i> | | | | |
| I. S. I. | ... | 250 | 250 | 250 |
| Cooperating Academies | ... | 120 | 24 | 48 |
| 4. <i>Miscellaneous</i> | | | | |
| Electricity & water Charges | ... | 500 | 563 | 500 |
| Advertisement | ... | — | — | — |
| Audit fee | ... | 350 | 350 | 350 |
| Conveyance | ... | 600 | 710 | 900 |
| Fire Insurance | ... | 253 | 253 | 253 |
| Bank Charges | ... | 250 | 189 | 250 |
| Allowance for secretarial assistance | ... | 525 | 525 | 420 |
| Sundries including peon uniforms & meeting exp. | ... | 2,800 | 2,673 | 2,600 |
| Subscriptions written off | ... | 120 | — | 144 |
| Symposium expenses | ... | 500 | 302 | 500 |
| Telephone expenses-office bearers | ... | 700 | 726 | 750 |
| Zonal Meeting expenses | ... | 200 | 88 | 250 |
| Progress of Science Reviews | .. | 2,640 | 1,720 | 2,000 |
| Special grant | ... | — | — | 2,000 |
| Dr. S. S. Bhatnagar Memorial Medal | ... | — | — | — |
| Furniture & office equipment | .. | 4,992 | 5,049 | 4,827 |
| Transfer to Govt. grant (Sale of Pubs) | ... | 5,000 | 5,279 | 5,000 |
| Excess exp. Solar Energy & Wind Power | 690 | 690 | 690 | — |
| Payment to CPWD—excess exp. on servants quarters | — | — | — | 308 |
| Dr. Meghnad Saha Memorial Medal | 1,000 | — | — | 1000 |
| Publication Grant to Asiatic Society | — | — | — | 1,000 |
| | | 23,520 | 20,955 + 1,006 | — |
| | | — | — | — |
| | | — | 21,961 | 24,780 |
| | | — | — | — |

Research Fellowship

| | | | | |
|---------------|-----|--------|-----------------|--------|
| Stipends Paid | ... | 24,159 | 24,159 | 16,800 |
| Contingencies | | 2,970 | 2,218 | 2,100 |
| | | — | 26,377 + 752 | — |
| | | — | 27,129 | — |
| | | — | — | 18,900 |





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N.I.S (INDIA)

Part of the

the Year

1959.

